The Chemical Age

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Notes and Comments

Accuracy in Analysis

THE Fuel Research Board paper on "An Investigation of the Accuracy of Routine Analytical Determinations on Coal and Coke" (THE CHEMICAL AGE, December 2, 1933, page 505) provides some useful object lessons for the consideration of the chemist. There is much in this bulletin which concerns every branch of physical and chemical measurement, even though its text be the application of the fundamental principles to fuels. It will assist the research man to interpret the results of his analysis, for he is peculiarly interested in such problems as the probable error of his results, and should know the attainable limits of accuracy of his methods and of the power of human measurement by those methods. This is an example of the truism that misleading results may follow from conclusions drawn from a variation in fractions when even the units are not to be relied upon. For instance, the carbon-hydrogen ratio of coals has been given no small prominence by those who would produce a "Classification" of coals. The carbon-hydrogen ratio of anthracite is 26, while at the other end of the table is lignite at about 9; between these are a number of gradations. But how far is it possible to be sure that our estimation of this all-important ratio is accurate? Thirty-four determinations on a given coal gave figures for carbon varying between 83.94 per cent. and 84.71 per cent.; the same series gave for hydrogen figures between 5.23 per cent. and 5.53 per cent. For an individual determination the C-H ratio may thus vary between 15.1 and 16.2. When a sufficient number of determinations have been made the probable error comes into play and the limits of accuracy are nearer than those just given, provided the experimental methods used are correct.

Sources of Error

THERE are these two factors that immediately affect the research worker, the accuracy of his methods and the number of observations necessary to attain a given degree of confidence in his figures. There is also a third error inherent in all measurements, namely the personal error. One worker may be consistently high and another consistently low. This is more difficult to allow for scientifically than the probability error, though less difficult than the error of incorrect methods. The only really reliable method is to work on a carefully prepared mixture of known composition, and even this is not easy to obtain as shown in the bulletin in question by the elaborate methods thought necessary to ensure a uniform mixing of the samples. It is particularly necessary that no method for chemical analysis or for the determination of physical properties should be used in research work unless it has been subjected to the rigorous scrutiny, somewhat upon the lines laid down in this Fuel Research Board paper. We tremble to think of the multitudinous papers that have been published upon coal research without first performing any of the investigations here referred to into the methods used. How many false conclusions rest upon evidence that is actually insufficient, but that is not yet known to be insufficient? Thoughts such as these, calling to mind the extreme care that research rightly entails, lead to the realisation that sucessful research is not solely an affair of brains, but involves the possession of a high degree of patience. It may not be only in the food industry (pace Dr. Lampitt) that the standard of published work is low—if we did but know it.

Works Tests

WORKS tests come under a somewhat different category. It may not always be necessary for the industrial routine chemist to visualise the limits of accuracy of the methods used; generally the limits of accuracy necessary for practical purposes dominate the work of the chemist. It is just as well that it should be so. The probable error of the mean of a series of observations is diminished in proportion to the square root of their number. If two determinations are performed and the mean is taken the probable error is not halved as many chemist believe, but is only divided by $\sqrt{2}$. It requires four determinations to halve the probable error, and the number of observations necessary to obtain a high degree of accuracy would be so large that there would not be sufficient time in industrial practice to perform them. To the extent of avoiding more than two similar analyses on one sample the principle of observing the practical implications of the results is recognised in industrial laboratories. The principle, however, should be observed further even than that, and it is partly on account of the failure to recognise this fact sufficiently that the accusation of impracticality is sometimes levelled against the chemist. In his laboratory the chemist is taught to proceed by cause and effect; from one ascertained fact to another. That is the basis of true scientific research, but not so with the works engineer. The works engineer, finding something is wrong, often cannot

and usually does not wait for a chemical investigation before making readjustments to his plant. Long before the chemist has completed the analysis of his sample the engineer has turned a valve that alters the *status quo* and is calling for another sample to be taken.

Hail Xanthophyllol !

IF there be more joy over one sinner that repenteth, what of the glee that will ripple through plant society on hearing of the disinterment of the long missing body of Monhydroxycarotene (*Kryptoxanthin*)? Hitherto, only the diols, Lutein(*ol*) and Zeaxanthin(*ol*); the triol, Flavexanthin(*ol*); the tetrols, Violaxanthin(*ol*) and Taraxanthin(*ol*); together with Fucoxanthin(*ol*) $C_{40}H_{56}O_6$, were known. Now, it is the turn of the Cape Gooseberries (*Physalis alkikengi* and *Franchetti*) to sing:—

" Oh, bother the flowers that bloom in the spring! Tra-la. Autumn pods and berries for us."

Drawing rooms may recognise a new charm in the decorative, deep orange capsules of these South African plants, even worship them together with the carrot and eventually grind them down to dust for use as Parmesan is used with soup. We can even imagine their conversion into lipstick material. There would be less need to fear the effect, in kissing off such colour. The Orange Tip is a beautiful butterfly! why not the Orange Lip? As the B.B.C. says, " Copyright reserved." This modest *ol* has hitherto blushed unseen, overlooked in the company of the more obtrusive *diol*, Zeaxanthol, present as dipalmitate, having been mistaken originally for carotene it also occurs as an ethereal salt and to the extent of almost a third of the crude *Physalis* colouring matter. In fact, it is as like to B-Carotene as are the proverbial two peas to each other. It has the signal honour of alone sharing with the three carotenes the A-precursorship characteristic of these singularly important hydrocarbons. A-starved rats grow upon it. Spectroscopically, it is indistinguishable from B-Carotene and Zeaxanthol. Again we have a discovery illustrating the easy slip between cup and lip. It should never be " Once bitten, twice shy " but ever " Try, try again." The news was brought in the November issue of the " Berichte." Coming events cast their shadow before them. We are told that a large bunch of *Physalis* was on the table, as centre piece, at the Athenæum dinner at the time of the British Association meeting, at which Professor Kuhn and other foreign guests were entertained. We congratulate Professor Kuhn (also Christoph Grundmann) upon this last addition to his wonderful gallery of natural yellow chromatographs. *Kuhn heisst er? Kühn ist er auch; ausserdem ausserordentlich geschickt und glaubenswürdig—ein geistvoller Beobachter und Naturforcher!*

Lactoflavin

THE " Berichte " to hand this week contains an account, by Kuhn, Rudy and Wagner-Jauregg, of the lactoflavin from milk, first described early in the year. By means of a difficulty soluble Thallium derivative, they have obtained nearly a gramme of the well crystallised, colouring matter *from* 5,400 *litres of whey*! They not only confirm the formula $C_{17}H_{20}N_4O_6$ but also verify the forecast that it is the B_2 vitamin. The compound behaves in a remarkable way on reduction and exposure to light. The following skeleton formula is given as a first approximation:—

The Work of the Universities

" FOR a University there can be no harbour. That is her syllabus for the years between 1933 and 2283." With these words SIR JAMES BARRIE concluded his address at the 350th anniversary of Edinburgh University, and they are as true for industry as for a university. Industry looks to the universities for discoveries in pure science and in the more abstruse problems of technical practice, so that the same watchword is justly and aptly applied to both. At the same assembly the Archbishop of Canterbury recalled that at a time when Oxford and Cambridge were the possession of a privileged class, the Scottish universities opened their doors to all without favour who came with the desire to learn. The sons of farmers, of tradesmen, of ministers, and lairds sat together in the same classrooms. When in England there was no ladder of education at all it was possible in Scotland for a " lad o' pairts " to pass direct from the parish school to the university. To-day the same is true of every university and it is to the universities that industry looks for that "ladder of education" which will ensure a continuous supply of the best men, adequately trained, for every branch of technology and commerce.

New Equipment

THE management executive is interested in new equipment from two viewpoints. In the first place, what will new equipment do above and beyond that which is accomplished by existing equipment? Secondly, how much lower are operating costs? This holds good for all unit processes. If existing methods are efficient, economical in power and labour, and inexpensive in respect of maintenance and repairs, it would be folly to make any change. But if new equipment can be profitably installed it is time to investigate this matter. It the existing equipment giving the best possible quality of product? Your electric motors—are the windings thoroughly insulated and effectively protected for use where there is dampness and moisture? Pumps, compressors and refrigeration plant must keep running. Motors must assure dependable operation. Is your grinding mill noticeable for its dustless condition when in operation? Can you feed the material at a properly controlled rate to maintain the maximum mill capacity? Is the final product of a uniform degree of fineness? Does the mill reject hard foreign particles? There are dozens of similar questions which present themselves when you take each plant unit in turn and consider its performance in terms of what you expect it to do—in regard to the things which would earn you a greater nett profit—or conditions which make for greater efficiency.

The Royal Society Meeting

A Papacy in Science

CONTINUING our analysis of the unusually significant address of the president of the Royal Society, the reference made to Sir Walter Fletcher is of peculiar interest, leading as it does to a remarkable disclosure of policy by the president. He not only considers the work of the Medical Research Council, in its connection with the Society; he also discusses that of other similar bodies. As far back as 1914, Sir Walter Fletcher was appointed the first secretary of the then newly-established Medical Research Committee, which was converted by Charter into a Council in 1920. He was peculiarly qualified. He had not only spent 20 years at Cambridge as tutor at Trinity College; he had also taken part in an experimental inquiry—the president forgets to say with himself—into the chemical events associated with muscular activity, a problem so intricate that it is still far from settled. Sir Walter was a man of striking personality, with an imposing, superior manner; in fact, he looked his part to perfection. So it came that he was able to do what no one else available for the office could well have done. He set the machine to work and kept the wheels going around, in spite of the kittle nature of his constituency. Whilst he had clear ideas, he had no particular gift of originality nor any real overload of the holy fire of scientific enthusiasm. His outlook was necessarily academic, owing to the character of his experience; consequently, the clinical side received no special encouragement at his hands. The fund administered by the Council amounted to no less than £148,000 in 1930-31. Owing to its operations, to quote the president—" It is not too much to say that while, 20 years ago, the current contribution of this country to the scientific side of medical progress was far too small to do it honour, it is now such as to earn universal respect." Maybe; none the less, we may ask—Is the work being done in ways and in directions that are now urgently in demand? Is the money being spent to full advantage? So much has happened in recent years to make the way clear where before it was undefined.

State Direction of Scientific Inquiry

After dealing with the Medical Council, the president proceeded to refer to the recently appointed Agricultural Research Council and then to the Advisory Council of the Department of Industrial and Scientific Research. He spoke of them as " collectively dealing with the three main departments of man's material activities "—a sufficient charge, in all conscience. Next comes a non-sequitur. " United under the aegis of the Privy Council, they are freed from the dangers of political vagaries and the inhibitions of departmental interference; the continuity of their work is secured." Surely, they but constitute a new State department, one controlling scientific workers generally? The work of the Royal Society, through its Government Grant Committee, was left out of account in the address, although referred to by implication.

Whether as merely a " See what a good boy am I " or as a direct challenge to public opinion, matters little. The whole question of State aid and State direction of the art and practice of scientific inquiry is brought under survey and into question by these statements. Academic interests were not thought worthy of mention, it would seem. What, too, of the Royal Society itself? Instead of acting as a Watch Committee, guarding Natural Science, through its president it is entering into an unholy bureaucratic alliance which may easily be made into a Papal State, wherein no man will dare lift up a hand except to a formula. The secretaries of the three councils are bound together in a single bundle, we are told. We can imagine the lictors carrying them about the country. Fascism would seem to be upon us. The ultimate independence of scientific opinion—it's " to be or not to be "—is clearly at stake. Should not Science take warning by Germany and without delay seek once more to assume control of its own house? It has little short of lost it beyond recovery; commercial forces are at work against it in every direction. Almost every worker is a pensioner.

The movement towards bureaucratic control has been engineered with extraordinary diplomacy and astuteness. At the close of the war, under a weak president and secretaries without vision, the Royal Society allowed an official of the Board of Education, with only literary qualifications, to filch —no other word is possible—control of scientific interests from the Society by the establishment of the Department of Industrial and Scientific Research. Protests were made at the time. Everything that was needed might have been done by the Society itself, at far less cost, by an extension of the Government Grant Committee and an organisation of the Society's forces as an advisory body. The late assistant secretary was always clear on this point. Scientific workers fell asleep under the soporific influence of the proffered government money bribes. Various industries were brought into the net. The wave of progress of industrial research may have been hastened a little but progress was inevitable and we believe it to have been no more than hastened. The war had opened all eyes. We had laid aside the chemical inferiority complex, which had so long dragged us in the mire—we had learnt to acknowledge openly that we were just as good chemists as the Germans, in fact, better; that the fault lay mainly with the commercial class, rather than with chemists. Billingham has found it quite easy to pull down nitrogen from the clouds with the aid of English steel, just as, later on, it has found no difficulty in hydrogenising coal. Given the desire to do such things and bidding the merely commercial mind, " Get thee behind me, Satan," we should inevitably have gone ahead in making industrial use of science, under the compulsion of the war wave—just as we have done in aviation—willy nilly the D.S.I.R. Of course, industry was glad to unload half the cost on the State; in the end, however, it often found that the assistance was dearly bought, because of the burden of red tape put upon its proceedings and activities. At most, it received only financial assistance.

The Lords of Science

If the Royal Society be anything at all, it is the House of Lords, the aristocracy, of our English science. If it do not so act, it falls to the level of a mere paper-reading, paper-publishing, Royal-medal-giving body, of no public worth beyond that of any other Society, having all but abrogated the great social position it once occupied. The letters F.R.S. will soon be no more worth wearing, of no more social significance than the X.Y.Z. of any of the bodies representative of special scientific interests. The reports of its Council, during years past, justify this view. There has been nothing in them; no evidence of work of public importance. The activities of the Royal Society of Arts, to which anyone may belong, have been of greater public value. The Royal Society is merely forwarding the work mostly of junior scientific inquirers, by publishing their results, often prematurely. In this, it is merely duplicating work that might equally well be done by the special societies. Although a collocation of the natural sciences, it makes no effort to voice the collective scientific opinion—no effort to educate a public-opinion faculty or complex into its Fellows.

Box and Cox Science

The last state is worse than the first. In his address, the president lays all the cards on the table and openly gloats over the fact that one of the secretaries of the Society is secretary of the D.S.I.R.; that the late president of the Society, Lord Rutherford, is chairman of the D.S.I.R. Council; that the senior secretary of the Society is a paid official of the Medical Research Council; that various Fellows are on the several councils; himself he is on them all. From head to tail, it is a Pooh Bah business; Cæsar can only appeal unto Cæsar. It is unthinkable that such a situation could have been created under the great leaders of the past, Stokes, Michael Foster, Huxley, John Evans, Ray Lankester and others. The Society, in fact, has all but surrendered the pass to bureaucracy; we are in sight of a Papacy. If truth be told, the greatest discovery since the war is the formation of a new branch of the Civil Service, the establishment of scien-

tific research as a sheltered, black-coated profession. It is an extraordinarily clever piece of social engineering.

In explaining the new Agricultural Research Committee, the president speaks of it as having "essential control of an enlightened and consistent policy." Can any committee, constituted of all and sundry, without a single member of proved constructive capacity in developing agriculture, in any way develop an enlightened and consistent policy? To begin with, there is not a single chemist on the Council—although agriculture is fundamentally a chemical pursuit. This is equally true of the Medical Council, although medicine is largely applied chemistry.

The situation is one of extraordinary difficulty: no doubt it is paved with good intentions, like another well-known resort. Our almost impossible task is to make a socially effective use of the vast fund of knowledge we have gained. A Royal Society established for the advancement of Natural Knowledge is surely called upon, first and foremost, to use all its forces to such end; to rise to a better sense of its inherent value. If it make no specific use of its potential forces, it must sink into social insignificance. It is essential that it should reconsider its activities in every direction—especially that it should constituute itself an advisory body for its own efficiency and preservation.

"Nothing in this world can afford to stand still, least of all our human energy; those who won't make an effort to hold what they have got will soon lose all and that goes for ideas as well as for ducats." These words are taken from the chapter on the Netherlands in Hendrik van Loon's most remarkable book "The Home of Mankind."

The Human Factor in Industry

Manufacturing Chemists Save Money

THE National Institute of Industrial Psychology has issued its thirteenth annual report and accounts, covering the period from January 1 to September 30, 1933. This period has seen a steady advance in the Institute's work in all its branches. Not only has the number of investigations in factories, offices and retail stores been maintained, but also, on the whole, they have lasted longer than those of last year; several of them have been extended two or three times. As in previous years, a wide range of problems has been solved in these investigations, from the reorganisation of an office to the design of a packing bench, from the study of an inspection process to the introduction of a rest pause.

Perhaps the most striking development during the nine months under review is the increase in the number of vocational guidance cases examined and advised at the Institute. During 1932, 627 cases were dealt with, and that represented an increase of 25 per cent. on the number during 1931. During the first nine months of 1933, however, 664 cases were examined, or 37 more than the total for the whole of the year 1932. The Institute's research work is about to feel the effect of the diminution of its main research grant—that of the Rockefeller Foundation. In 1934, £1,500 will be received, compared with £2,799 in 1932. In 1935, the grant will drop to £1,000, and in 1936 a final grant of £500 will be received. Either, therefore, the Institute must drastically cut its research programme, or it must find new sources of revenue.

Calico Printing and Dyeing Works

The Institute has devoted considerable attention to methods of preventing incorrect processing in certain calico printing and dyeing works. Records of faults and damages are being filed so that when each order is put into work it will be possible to determine, from experience, which combinations of cloth and colour are most likely to lead to difficulties, and at which points in the process such difficulties are most likely to occur. This class of difficulty is largely due to the operatives' lack of familiarity with and lack of understanding of the more recently developed processes.

Another large class of faults and damages may be ascribed to carelessness, lack of interest, and lack of appreciation of the value of materials. Schemes have been evolved by which those workers who can be held responsible for the quality of production are paid a bonus on every unit correctly processed, and penalised (from their bonus earnings) for every unit incorrectly processed on the machines under their control.

In order to prevent faults from passing undiscovered or unreported, a system of inspection has been drawn up. Acceptance of goods in process by one department would absolve previous departments from responsibility for all faults not reported by the accepting department. Allied with this scheme is an arrangement by which responsible operatives at key points undertake a specified amount of inspection work.

A series of tests has been devised for the selection of apprentice machine printers; these include tests of intelligence; of the speed and accuracy of reaction to visual and auditory signals; of abilities such as discrimination of size, shape and pattern; and of other abilities such as discrimination of slight variations in straightness, thickness, angle, gap, and various grades of weight. The Institute has been able to encourage a more general appreciation of the difficulties experienced by the management, foremen and operatives in the performance of their respective duties, and thus to foster a more catholic view of responsibilities.

Manufacturing Chemists' Offices

In the offices of a company of manufacturing chemists, the Institute co-operated with the accountant in reorganising the clerical work of the accounts department. The new system will involve an outlay of about £2,000; it should effect savings of £700 a year, and will enable monthly statements to be delivered ten days earlier than at present. A scheme for completing invoices by machines, recommended by the Institute, has been adopted by the company. The outlay involved here is £700, and it is estimated that the savings effected will amount to about £620 a year. The Institute also experimented with the use of continuous stationery, and showed that it would save 15 per cent. of the invoice typists' time. Continuous stationery is now in use. The lay-out of the offices has been replanned with a view to increasing ease and speed of work. While this work was in progress, the Institute reviewed the personnel management of the offices. It made recommendations concerning methods of recruitment and conditions of services, and it devised a series of tests for selecting the various grades of office employees.

Soap Works

Congestion of space was the great difficulty at a certain soap works, although new buildings were being provided to relieve it. One of its main results was wastage of soap; slabs of soap had to be piled in stacks, and the soap was frequently damaged when the piles were broken down. The Institute recommended storing as much soap as possible on movable stills. The wrapping and cartoning processes formed a "bottle-neck" in production. Owing to the different speeds of these processes and to variations in the type of packs, it was almost impossible to allocate staff properly to the various teams; in a typical run, the Institute found that unproductive time occupied eleven per cent. of the total time. The Institute recommended the mechanisation of these processes or, alternatively, the mechanisation of wrapping only. The first measure would reduce costs by £750 a year, and the second by £375 a year.

A detailed movement study of the stamping of soap tablets revealed means by which the work could be made both quicker and less fatiguing for the workers. In a trial of the new methods, two girls increased their output by 35 and 47 per cent. In the despatch department changes in organisation were recommended to expedite the despatch of soap and to make the flow of work smoother.

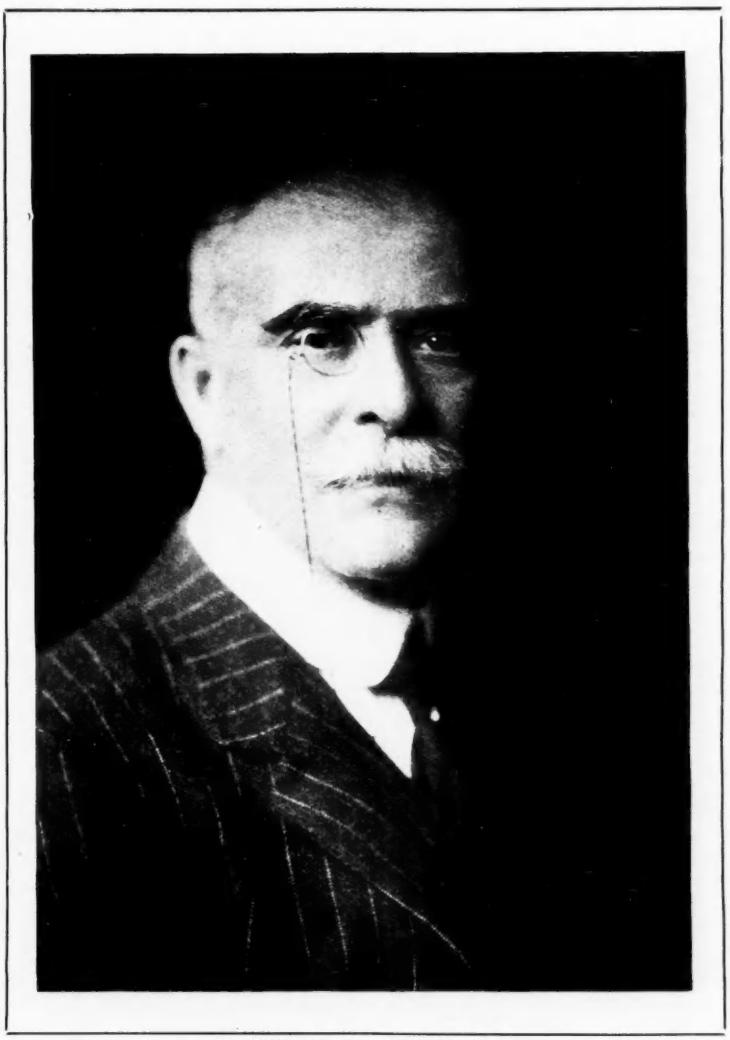
Death of Colonel Sir Frederic Nathan

Famous Expert on Explosives

THE death occurred at his residence at Cornwall Gardens, London, on December 10, of Colonel Sir Frederic Lewis Nathan, the well-known expert on explosives, at the age of 72. The son of Mr. Jonah Nathan, and brother of the Right Hon. Sir Matthew Nathan, who was formerly Governor of Queensland, Sir Frederic Nathan was born on February 10, 1861. Educated privately and at the Royal Military Academy, Woolwich, he was gazetted to the Royal Artillery in 1879.

After seven years regimental service at home and in India, he was appointed Captain Inspector of the Royal Laboratory, and in 1888 assistant to the Director General of Ordnance Factories. At Woolwich he assisted in the development of the magazine rifle, and under Sir Frederic Abel's explosives committee he worked out manufacturing processes for the production of cordite.

In 1892 he was appointed to the Royal Gunpowder Factory at Waltham Abbey, where he served for seventeen years, first as assistant superintendent, and later as superintendent. Sir Frederic retired from the army in 1909 and became works manager of the Ardeer factory of Nobel's Explosive Co., Ltd., for the organisation of which he was largely responsible. In the early days of the war he joined the Admiralty to design and superintend the erection of a cordite factory for that Department at Holton Heath, Dorset, and later he became Director of Propellant Supplies under Lord Moulton.



Sir FREDERIC L. NATHAN, K.B.E.

For the last three years of the war he was responsible for the provision of propulsion explosives for the army and for certain industries supplying raw materials. He was also for some time officer in control of alcohol under the Ministry of Munitions and chairman of the production section of the inter-departmental committee on the production and utilisation of alcohol for power and traction. In January, 1920, he was appointed power alcohol investigation officer under the Fuel Research Board of the Department of Scientific and Industrial Research.

He was knighted in 1906 and created a K.B.E. in 1918, and he had also received Russian and Belgian decorations. Sir Frederic was an active member of the Institution of Chemical Engineers, and was its president in 1925-1927. He devoted his presidential address to the Institution in 1926 to the question of industrial efficiency, with special reference to the elimination of unnecessary waste, and he expressed the view that in factories where chemical engineers were employed they should be able to deal with most of the problems of industrial efficiency in connection with materials and general charges.

With regard to labour problems, however, industrial psychology was such a special science that it would be best to retain the services of experts, at all events in the first instance. He urged that such organisations as the Federation of British Industries and the Association of British Chemical Manufacturers, as well as the research associations established under the Government schemes for industrial research should take up the problem of eliminating waste, and he expressed the hope that concerted action would be taken, in which the members of the Institution of Chemical Engineers would be only too willing to play their part.

Sir Frederic Nathan was also interested in bibliographical matters and advocated an international scheme for abstracting and indexing scientific and technical literature. He was editor of the "Power and Fuel Bulletin," issued by the British National Committee of the World Power Conference, of which he was an individual member. He had also been vice-chairman of the Association of Special Libraries and Information Bureaux (the A.S.L.I.B.) and a member of the Institut International de Documentation.

The funeral, which was of a private character, was at the Willesden Jewish Cemetery on Tuesday.

THE total exports of lac from Bengal during the year 1932-33 amounted to 415,000 cwt., valued at Rs.123 lakhs, as against 456,000 cwt. valued at Rs.182 lakhs, in the previous year. The United Kingdom purchased 93,000 cwt., the same as in the previous year, but the purchases by the United States of America declined from 102,000 cwt. to 66,000 cwt. Germany's purchases remained at about 35,000 cwt.

Magnesium and Its Light Alloys

Means for Protection Against Corrosion

ENGINEERS are greatly attracted by the use of magnesium as it would reduce the deadweight of aircraft by about one-third. Magnesium alloys are already being used for pistons and their use is also proposed for deck fittings of speed craft. Unfortunately, however, magnesium is very liable to corrosion, especially when exposed to sea-water or moistuure. An impetus to its most extended use should therefore follow from the discovery of satisfactory methods for protecting it against corrosion. Some very promising methods for this purpose have resulted from work carried out at the Chemical Research Laboratory, Teddington. The process has the merit of simplicity, as it consists only in immersing the magnesium materials in a solution of selenious acid or its salts for about 15 minutes. This results in the article becoming covered with a protective coating of selenium. The value of the treatment, Dr. Bengough pointed out, is likely to be greatly increased by the fact that the coating appears to afford a very satisfactory basis for applying paints which may sometimes be necessary in cases of prolonged or severe exposure. The authors stated that much work has been done to find some metal or metals which would notably reduce the corrosion of magnesium and increase the strength and yet not seriously increase the weight. This would be the best way of protecting the metal since, even if protection depended on surface film formation, the film might be self-healing in some type of corrosive conditions. The field has been fairly well explored and further important discoveries, though possible, do not seem very likely. Manganese is now always used, and most alloys contain aluminium in amounts up to 12 per cent. Zinc, by itself, is not used, but some of the best alloys from a mechanical point of view contain both zinc and aluminium.

The corrosion and protection of magnesium and its light alloys was the subject of a paper by Dr. G. D. Bengough and Mr. L. Whitby read before the Institution of Chemical Engineers on December 8. The chair was taken by Mr. W. A. S Calder, in the absence of the President, Lord Leverhulme.

A Protective Film

Failing further progress in making alloys, magnesium alloys will probably be protected against severe corrosive conditions by paints applied over some form of chemically produced film, without which paints are unsatisfactory. It is easy to produce films or light alloys of magnesium owing to the high reactivity of the metal, but very few of them are of any value. The alum-dichromate and selenium processes are the residue after drastic elimination, and the former has been tested on a large scale in the R.A.E., Farnborough. These processes have, therefore, some claim to special consideration, but the possibility of the discovery of rival, and even improved, processes is still considerable.

The selenium process consisted in immersion for 5 min. at laboratory temperature in 10 per cent. selenious acid solution containing 0.5 per cent. of sodium chloride. Part of the success of the selenium process under conditions of spray is due to a limited power of self-healing which probably occurs in the following way. The magnesium surface becomes coated with a thin layer of magnesium selenide, which is decomposed by water penetrating through pores in the thicker covering layer of selenium. The hydrogen selenide thus formed reacts with oxygen to give selenium, which seals the pores through which the water penetrated. In some cases the process is applied after immersion of the alloy for a few seconds in 1 per cent. chromic acid at 90° C. washing and then immersing in selenious acid, or in a mixture of sodium selenite and phosphoric acid. By the use of sodium selenite acidified with phosphoric acid, decorative films were obtained, the colour ranging from pale gold to red according to the time of immersion; the thicker film could be made a dark purple-black by heating to 90° C., a process which probably converts the selenium to the grey allotrope. Films produced by the selenite bath were rapidly destroyed if washed immediately after removal from the bath; if allowed to drain dry before washing, however, the films became quite stable. Lanoline definitely increased the rate of attack compared with bare metal, probably owing to the formation of large adherent drops of sea water after spraying. Clearly lanoline is not always so impermeable as is generally assumed. Some of the paints also increased the attack, but sulphur-treated oil pigmented with zinc chromate and reinforced with a top coating of aluminium pigmented cellulose gave excellent protection for a year, and it is unlikely that much deterioration of mechanical properties had occurred. The selenium film gave relatively good results, both bare and covered with every paint. Aluminium was the best pigment and zinc oxide was harmful, although in immersed conditions it is sometimes better than aluminium; titanium dioxide caused cracks in the paint and large weight losses. Aluminium gave the worst results throughout, probably because local couples were set up; with an insulating medium like thermoprene resin the effect is least noticeable. Zinc chromate was usually much better than barium chromate and, in presence of a top coating, gave almost perfect protection in three of the mediums for the whole time of test, 9½ months.

One of the uses proposed for light magnesium alloys is for deck fittings of destroyers and other craft where lightness is important. Such fittings may undergo temporary immersion and any protection process must be adequate to resist this treatment. Preliminary experiments showed that none of the chemically produced coatings hitherto tested was likely to afford useful protection against prolonger immersion in sea water. It was thought, however, that some paints might do so. These were prepared in the laboratory, and the proportion of pigments was about half the weight of the medium. Three coats were sprayed on, each being allowed to become hard before the next was applied. The alloy was then immersed in sea water for 28 days. The tests included a number of unimpigmented paint media, and then the same medium with either an alkaline pigment, such as zinc oxide or a passivifying pigment, like zinc chromate.

The next step was to obtain increased protection by the use of a top coating. The thermoprene resin did not take a top coating well, so sulphur treated oil and a quick-drying tung oil-base medium were used, both pigmented with zinc chromate; the tung oil medium had the advantage of quicker drying since the process only took a few hours. Protection is much increased by the top coating, which in turn is improved with two of the mediums by the presence of a pigment, particularly zinc oxide which was chosen because of its mild anti-fouling action; tests show it to be generally superior to aluminium powder. The efficiency of the top coating varies somewhat and was probably affected by climatic conditions during application. The superiority of cellulose to other top coatings was not so marked as in the spray tests in which it was very decidedly best.

Points from the Discussion

Mr. J. E. HAYGARTH suggested that the solution used by the authors, containing only 15 per cent. of lanoline, would deposit a very much thinner protective coating than that normally used by Government Departments and industry generally. Such a solution was really too thin for anything in the way of sea water spray and it had been proved at the National Physical Laboratory that when the correct consistency of this solution was used with a representative lanoline, the material stood up very well to salt water corrosion. A great deal also depended on the type of lanoline used because unless it had a very low fatty acid and ash content and was also free from moisture, it might very easily have harmful effects and its protective qualities were seriously impaired.

There were certain analyses for lanolines for rust prevention which indicated the particular type to be used and the National Physical Laboratory had one of their own. There was also a suggestion that very thin films of lanoline had to be used on account of cost, but lanoline was comparatively cheap.

Mr. WHITBY, replying to Mr. Haygarth, said he doubted whether a thick film of lanoline would be more effective than a thin one if by any chance there were pores in it. He confessed he was not aware there were various types of lanoline, and added that in the case of these tests no attempt was made to ascertain the water, fatty acid and ash content.

Dr. H. SUTTON (Royal Aircraft Establishment) agreed that zinc chromate is a very good pigment in enamels and paints on magnesium alloys. As regards commercial pigments, zinc chromate was probably better than barium chromate and at Farnborough they had been led to the use of chromates as pigments in enamels for use on magnesium alloys by the fact of chromate solutions being known to produce protective films. Cellulose top coats had also been used with success for the protection of magnesium alloy parts on British aircraft, whilst coatings containing zinc oxide as pigments had in general been found to give rather better results than those containing aluminium powder as pigments. One important practical disadvantage of the selenium treatment process was that enamelled or painted pieces developed small blisters on exposure to atmospheric or marine conditions and the entire surface seemed to become slightly roughened with minute red postules. This rather tended to prejudice the practical man who wanted a really good finish on his job. This effect appeared to be not entirely eliminated by the use of the sulphur-treated oil protectives and was a serious disability of the selenium treatment.

Mr. D. GORDON BAGG, speaking of the use of lanoline and the statement in the paper that it is not as impermeable as is generally assumed, said that water is soluble in lanoline and suggested that in the case of atmospheric corrosion the water in the fat formed a protective layer—a hydroxide—on the suurface of the magnesium thereby preventing further attack, whilst in the case of sea water the attack was auto-catalysed by the formation of aggressive chloride corrosion products.

Mr. G. W. LACEY (Birmingham Aluminium Casting Co., Ltd.) said the results in the paper seemed to suggest that not much reliance could yet be placed on the paint layer, whatever the medium, in addition to selenium or any other process of forming a protective coating on the metal. More research was necessary in this direction. As a matter of information for the authors he mentioned the effect of fatty acids on magnesium when inferior lubricating oils or recovered oils were used. In such instances the selenium process afforded no protection whether there was any paint coating or not. In connection with the building of boats, in which his company has been specialising with a certain aluminium-magnesium alloy, it had been found that the paint materials peeled off after blistering, but more recent experiments had overcome this, the method adopted being the addition of an intermediate coating of aluminium pigmented varnish before adding the final coating. In this connection he mentioned the necessity for studying the paint system in relation to the surface to which it had to be applied.

Dr. J. O. CUTTER said that although paint had been condemned during the discussion it should be pointed out that by consideration of a particular paint system it was possible to use paints successfully. Moreover, in the experiments described in the paper he regarded the specimens as being too small upon which to carry out anything like a complete series of experiments.

Dr. A. J. V. UNDERWOOD suggested that after getting a magnesium surface on which some oxide had been formed, would it be possible to treat that with magnesium chloride to form a magnesium oxy-chloride cement as a protective layer. In that way possibly very dense materials might be obtained which would serve to exclude the air. On the other hand, the presence of chlorine might serve to increase the rate of corrosion.

Mr. WHITBY replied that what Dr. Underwood had suggested might be done and a very nice film might be obtained in that way.

The 1934 British Industries Fair

Preliminary List of Chemical Exhibitors

DESCRIBED by the Prince of Wales as "a factor of the first importance in the commercial life of this country and in advertising British goods to the world," the British Industries Fair continues its remarkable growth in face of all the forces of world depression. The 1934 Fair will be held at Olympia and the White City, London, and at Castle Bromwich, Birmingham, from February 19 to March 2. Four months before the opening date, bookings of space by exhibitors at Olympia, in the furniture section at the White City, and at Birmingham, exceeded the total allotments at the 1933 Fair—which itself was larger than any of its predecessors. At Birmingham, extensive additions to the Fair buildings have again been necessary to cope with the demand.

Commenting upon the developments, business leaders representing industries taking part in the Fair have expressed their confident belief, based upon the facts within their own experience, that trade revival has not only begun but will continue. Reports from exhibitors give striking testimony to the vitality of British industry and to its successful adaptation, during recent years, to the changed conditions of the times.

Preliminary lists of exhibitors in the chemical and druggists' sundries sections are as follows:—

CHEMICAL SECTION.

Albright and Wilson, Ltd.
Aquamellis Engineering Co. Ltd.
Association of British Chemical Manufacturers,
A. Boake Roberts and Co., Ltd.
British Industrial Solvents, Ltd.
W. J. Bush and Co., Ltd.
Electro Chemical Processes, Ltd.
Ferris and Co., Ltd.
Gas Light and Coke Co.
General Chemical and Pharmaceutical Co., Ltd.
High Speed Steel Alloys, Ltd.
Hopkin and Williams, Ltd.
Howards and Sons, Ltd.
Imperial Chemical Industries, Ltd.
Imperial Smelting Corporation, Ltd.
Johnson and Sons (Manufacturing Chemists), Ltd.
B. Laporte, Ltd.
Macfarlan and Co., J. F.
T. Morson and Sons, Ltd.
Shawinigan, Ltd.
Society of Chemical Industry.
South Metropolitan Gas Co.
Spencer Chapman and Messel, Ltd.
Tett Bros., Ltd.
Tyrer and Co., Ltd.
Whiffen and Sons, Ltd.
Williams (Hounslow), Ltd.

DRUGGISTS' SUNDRIES SECTION.

Anzora Perfumery Co., Ltd.
The Auto Steel Co. (showing with the Vulfix Shaving Brush Co.).
Bathe's, Ltd.
Lewis Batley and Co.
Bellchambers Glass Bottle Co., Ltd.
T. F. Bristow and Co., Ltd.
E. N. Bromage and Co.
Butner and Earle, Ltd.
Druggists Specialities, Ltd.
Dubarry and Co.
Faudels, Ltd.
The Floragen Works.
Freers Manufacturing Co., Ltd.
Corfield, Ltd.
P. B. Cow and Co., Ltd.
T. W. Culmer and Sons.
Cussons, Sons and Co., Ltd.
Health and Hygiene, Ltd.
Hopes Soaps.
F. Hulse and Co., Ltd.
The Impex Co.
J. G. Ingram and Son, Ltd.
Isola, Ltd.
Iva Fur Purs, Ltd.
Jago and Jerome, Ltd.
Kaputine (General) Syndicate, Ltd.
Lacco Proprietors, Ltd.
H. S. Lovell and Co.
Manon Frères, Ltd.
Chas. Midgley, Ltd.
Ozonol Laboratories, Ltd.
Papier Poudre, Ltd.
Pharmetics, Ltd.
Potter and Moore, Ltd.
Redio Co., Ltd.
Reliance Rubber Co., Ltd.
Rio Perfumery Co.
W. J. Robson and Co.
Shavex Zee-Kol Co., Ltd.
Solport Bros., Ltd.
Alexander Stockton and Co., Ltd.
The Trade Commissioner for Mysore in London.
Viscose Development Co., Ltd.
Wonder Products, Ltd.
Zenobia, Ltd.

Notes and Reports from the Societies

The British Association

Presidents for 1934 Meeting at Aberdeen

THE annual meeting of the British Association, 1934, will be held at Aberdeen from September 5 to 12, under the presidency of Sir William Hardy, F.R.S. The following sectional presidents have been appointed:—Mathematical and Physical Sciences, Professor H. M. Macdonald, F.R.S.; Chemistry, Professor T. M. Lowry, F.R.S.; Geology, Professor W. T. Gordon; Zoology, Dr. E. S. Russell; Geography, Professor A. G. Ogilvie; Economic Science and Statistics, Professor H. M. Hallsworth; Engineering, Professor F. G. Baily; Anthropology, Capt. T. A. Joyce; Physiology, Professor H. E. Roaf; Psychology, Dr. Shepherd Dawson; Botany, Professor A. W. Borthwick; Educational Science, Mr. H. T. Tizard, F.R.S.; Agriculture, Professor J. A. S. Watson. The president of the conference of delegates of corresponding societies will be Col. Sir Henry Lyons, F.R.S.

Society of Public Analysts

Election of New Members

AN ordinary meeting of the Society of Public Analysts was held at the Chemical Society's Rooms, Burlington House, London, on December 6, the president, Mr. F. W. F. Arnaud, in the chair.

Certificates were read in favour of S. Emsley, G. F. Hall, W. M. Keightley, Dorothy M. Mathews, R. P. Page, Hilda M. Perry, A. D. Powell, and Winifred E. Smith. The following were elected members of the Society:—W. E. Baier, A. Dunsmore, D. C. Garratt, C. J. Regan, and R. H. Slater.

The chemical examination of furs in relation to dermatitis was the subject of a further paper by Dr. H. E. Cox, who now dealt with chemical reactions of dyeing with *p*-phenylene diamine and *p*-amino phenol. A quantitative study of the oxidation of *p*-phenylenediamine by hydrogen peroxide in the presence of fur shows that the principal pigment formed is an azine combined with the fur proteins. Some Bandrowski's base is found on the surface of the fibres, and there exists in the solution in the dye-bath much free *p*-phenylenediamine unoxidised, together with some Bandrowski's base and traces of quinone and ammonia. Similar data are given in respect of *p*-amino phenol which forms an oxazine in an analogous manner. The azine from *p*-phenylenediamine forms a leuco compound with the addition of only 0.18 per cent. of hydrogen by action of titanous chloride; it can be formed by direct oxidation of Bandrowski's base in solution and has at least nine benzene rings in its constitution.

A New Specific Gravity Bottle

A specific gravity bottle, devised by the late Mr. C. H. Cribb, was demonstrated by Mr. T. McLachlan. In order to avoid the necessity for a water-bath with thermostatic control, this bottle, which has a thermometer stopper, is provided with a glass bulb sufficiently heavy to sink in any ordinary fluid and having a diameter about twice that of the neck of the bottle.

The use of the air-damped balance for the determination of total solids in milk was described by Capt. John Golding, who pointed out that very rapid determinations of milk solids can be made by evaporating about 1 gram of the milk in an aluminium cap (which cools very rapidly) and weighing the residue on an air-damped prismatic reflecting balance (Oertling).

A rapid method of determining minute quantities of nitrites was the subject of a note by Mr. G. G. Rao and Mr. K. M. Pandalai. In this iodimetric method the iodine liberated by the interaction of nitrous acid and hydrogen iodide is titrated in the presence of carbon dioxide evolved within the liquid itself. This prevents oxidation of the nitric oxide, also formed in the reaction, and expels it from the system, thereby eliminating the action of the resulting nitrogen peroxide on the iodide.

The Chemical Society

Scientific Meeting

AN ordinary scientific meeting of the Chemical Society will be held on Thursday, December 21, when the following papers will be read:—"The homogeneous catalysis of stereoisomeric change in oximes" (T. W. J. Taylor and D. C. V. Roberts); "The intramolecular strain in substituted dihydroresorcinols, Part II. Substituted phenyldihydro-resorcinols" (L. E. Hinkel, E. B. Ayling, and J. F. J. Dippy); "The mobility of groups containing a sulphur atom, Part III" (D. W. Cowie and D. T. Gibson); "The optical activity of a diphenyl derivative, the dissymmetry of which is caused by the space effect of only one group" (M. S. Lesslie and E. E. Turner).

Society of Chemical Industry

Manchester and Liverpool Sections

A JOINT meeting of the Manchester and Liverpool Sections of the Society of Chemical Industry will be held on Friday, January 5, 1934, at Liverpool, when a visit will be paid to the Aintree factory of Wm. P. Hartley (London and Aintree), Ltd., and tea will be provided in the Chemistry Library of the Liverpool University. In the evening a joint meeting will be held in the Chemistry Lecture Theatre, The University, when the Jubilee Memorial Lecture entitled "Some Fundamental Scientific Problems in the Food Industry," will be delivered by Dr. L. H. Lampitt, F.I.C. There will also be an informal dinner at the University Club, Mount Pleasant.

Bristol Section: British Chemical Stoneware

BRITISH production of chemical stoneware is now 600 per cent. more than it was in 1923, while German imports have fallen to 20 per cent. of what they were then, said Mr. G. N. Hodson, when giving a lecture at Bristol University on December 7. The occasion was a joint meeting of the Bristol Section of the Society of Chemical Industry and the Chemical Engineering Group. Mr. Hodson's address, which was illustrated by lantern slides, dealt with the development of British chemical stoneware. A lively and informative discussion followed the lecture, and Mr. McNab, chairman of the newly-formed British Standards Institution Committee on Chemical Stoneware, voiced the general appreciation of Mr. Hodson's remarks.

Edinburgh Section: Identification of Blood Stains

PROFESSOR James Glaister, of Glasgow University, addressed the Edinburgh Section of the Society of Chemical Industry on December 8, and revealed the fact that human bloodstains can be definitely identified by scientific tests even after a lapse of many years. Blood, he said, was one of the most difficult substances to eradicate. Tests had been made with bloodstained clothing which had been either steeped in cold water or boiled, and these had proved that it was still possible to identify a stain as that of human blood after the clothes had been soaked for a period of five hours. There can be no doubt that when an individual expresses an opinion of human blood, he shoulders a very great responsibility, as his finding may involve the life of an accused person on trial for murder. Experience, faultless technique, and patience are therefore essential before an examiner should express a view as to the nature of the stain submitted to him, added Professor Glaister.

Liverpool Section: "Mechanisation of Research"

AN interesting lecture on the "Mechanisation of Research" was delivered to members of the Liverpool Section of the Society of Chemical Industry, at Liverpool University, on December 8.

The lecturer, Major F. A. Freeth, D.Sc., F.R.S., joint managing director of research to Imperial Chemical Industries, Ltd., said that he thought a good deal of mechanisation

was inevitable in modern life, but there was a great deal of nonsense talked about mechanisation. During the war he and many others were concerned with the manufacture of certain forms of high explosives, notably ammonium nitrate. This country relied to a very great extent upon imported sodium nitrate for its supply of fixed nitrogen. The usual procedure had been to take sodium nitrate and treat it with sulphuric acid for the manufacture of nitric acid, which could then be used for the production of explosives. It soon became evident that the supplies of sulphuric acid to do this were not available and it was suggested that ammonium nitrate might be made by a double decomposition of fixed ammonium salts, such as ammonium sulphate. This presented a difficult problem but by an extraordinary piece of good fortune, his colleague, Dr. Cocksedge, who was now head of research of I.C.I. (Alkali), Ltd., and himself, had worked out in very fair detail a large number of the necessary equilibria for such processes. Most of the setbacks they had were due to the fact that they had not really done quite enough formal work, but when the formal work was completed, they were in the position of men who had a reliable map of a country and knew their way about. There were any number of similar problems connected with both academic and industrial research. It was inevitable in the present state of science that so called research must in many cases be of rather a mechanised nature.

Reasonable Variables of Nature

Every research department of any scale ought to be able to command the reasonable variables of nature so easily that it should be taken for granted. By the reasonable variables of nature were meant temperature of from say 50° absolute to 2,000° C.; pressures from black vacuum up to, say, 5,000 atmospheres, together with mechanical facilities which would enable a research worker to overcome his difficulties. There were not many laboratories in this country that could do this. Every research department should also possess a reasonable supply of first class glass blowers; fine mechanics capable of making any reasonable scientific instrument of a new type; adequately fitted engineering shops under direct control of the department, ample supply of liquid air, and a good induction furnace.

What were the dangers of mechanisation of research? asked Major Freeth. The answer was, the danger of mechanising the minds of their research workers. He would not say that such dangers did not receive a certain amount of recognition, but they were not sufficiently talked about. There was a tremendous difference between research and discovery. There were two ways in going about research; one was to read everything and the other was to read nothing at all. If they read everything, they must be very wary indeed as to how they exercised their critical faculties in summing-up the work. There was, unfortunately, a tremendous amount of rubbish published, and if they did not agree with the conclusions of any author and they thought they had any reasonable grounds to do so, he would strongly advise them to go after their doubts. *There was also another kind of mechanising which was not good and that was the increasing amount of administration which took place in life.*

In the course of discussion, Professor E. C. C. Baly said that one thing he was particularly interested in was the enormous number of chemical journals. He felt that this multiplicity was a definite drawback to chemical research. The literature, he alleged, was very largely written by people of second-rate intelligence. Grants of money to the universities were all very well in their way, but the great difficulty in the universities was to keep for a time their best research men.

Physical Society

Exhibition of Scientific Instruments

THE twenty-fourth annual exhibition of Scientific Instruments and Apparatus, arranged by the Physical Society, will be held January 9-11, 1934, at the Imperial College of Science and Technology, Imperial Institute Road, South Kensington, S.W.7.

The leading manufacturers of scientific instruments will be exhibiting their latest products in the trade section. The research and experimental section will contain contributions from most of the important research laboratories in Great Britain, and there will be a special sub-section devoted to experiments of educational interest. In addition, the work submitted for the craftsmanship competition by apprentices and learners will be on view. Discourses will be delivered each day at 8 p.m. as follows:—January 9, "The Evolution of the Galvanometer" (R. S. Whipple); January 9, "The Instrumental Side of Colorimetry" (J. Guild); January 10, "The History and Development of the Thermionic Valve" (Sir J. Ambrose Fleming); January 11.

Members of institutions and scientific societies may obtain tickets of admission for January 9 and 10 from their secretaries; tickets may also be obtained direct from the Exhibition Secretary, 1 Lowther Gardens, Exhibition Road, S.W.7. On January 11 admission can be gained without tickets.

Midland Metallurgical Societies

Birmingham : Copper Refinery Control

MEMBERS of the Midland Metallurgical Societies (comprising Staffordshire Iron and Steel Institute, Birmingham Metallurgical Society, and Birmingham Section of the Institute of Metals) attended a lecture given by Mr. D. W. Aldridge, superintendent of the copper refinery at Prescot, at Birmingham, on December 7. Mr. Aldridge dealt with the Prescot establishment. He described the general lay-out of the plant and the method of operation, and gave particulars of the techniac control.

Institute of Fuel

North West Section : Solid Smokeless Fuel

A JOINT meeting of the Manchester District Association of Gas Engineers and the North Western Section of the Institute of Fuel was held at the Engineers' Club, Manchester, on November 29. Mr. G. Dixon, president of the Manchester District Association of Gas Engineers, presided, accompanied by Mr. E. Watson Smyth, chairman of the North Western Section of the Institute of Fuel. A lecture on "Solid Smokeless Fuel" was delivered by Dr. E. W. Smith.

The lecturer discussed the possibilities of the gas and coking industries adopting methods of low temperature carbonisation. He said there were about 40 million tons of fuel used in the domestic grate at the present day, while the gas industry carbonised about 18 million tons of coal, making about 9 million tons of coke. The industry had a ready market for well over 8 million tons of that 9 million tons, so that even if they wanted to supply the market for the domestic grate there was only one million tons available for the purpose. The question arose as to whether the industry should endeavour to produce a coke which was specialised for that particular market, because there would always be a demand for industrial coke. His own view was that the gas industry should continue to improve its coke, but not at the expense of gas production costs. If they desired to be, as they might, the purveyors of another type of fuel which might be called a low temperature coke, then they would have to consider the question from the point of view of the process as a process distinct altogether from the gas industry

Institute of Chemistry

Edinburgh and East of Scotland Section

THE second meeting of the Edinburgh and East of Scotland Section of the Institute of Chemistry for the session 1933 34 was held jointly with the local section of the Society of Chemical Industry on November 24, when Mr. Wm. Bain gave a paper entitled "Plastics and their Application to Friction Fabrics."

The lecturer stated that vast quantities of resins and plastics are utilised to meet the world's requirements and, as the sources of natural or fossil resins are by no means abundant,

it is possible that the supplies may become exhausted. Plastic materials may be made from (1) natural resins, (2) cellulose products, (3) casein obtained from milk, and (4) synthetic resins. When mixed with fillers and colouring matter and moulded at high temperature and pressure these materials produce articles of great beauty which can be utilised in many different ways. The lecturer described how the asbestos rock is treated on suitable textile machines and, mixed with small proportions of cotton and brass wire, is woven into fabric of any desired weave. After impregnation with pitches and oils the asbestos is pressed to form the bonded friction linings. Brake linings made from these materials are not entirely satisfactory as the pitches tend to soften under the influence of the heat generated by the friction, causing the brake blocks to adhere to the drum. This objection, however, has been largely overcome by using synthetic resins in place of pitches. These resins are quite infusible at the temperatures usually reached in the brake drum of an automobile.

The lecture was illustrated by a number of lantern slides showing various stages in the manufacture and testing of the friction material, and numerous examples of raw, intermediate and finished products were on view.

Manchester Section: Annual Dinner and Dance

THE Manchester and District Section of the Institute of Chemistry held a very successful dinner and dance on December 7, in "The Manchester," Ltd. About 300 members and friends were present, including the President (Professor J. F. Thorpe), Mr. and Mrs. R. B. Pilcher, Mr. C. H. Creasey (Board of Education), Mr. John Allan (president of the Manchester Library and Philosophical Society), and Mrs. Allan, Mr. C. J. I. Cronshaw (managing director of the Dyestuffs Group of Imperial Chemical Industries, Ltd.), and Mrs. Cronshaw, Dr. Schedler (chairman of the local section of the Society of Chemical Industry), and Mrs. Schedler, Principal Mouat Jones (College of Technology), Professor Heilbron, Mr. Brazier (chairman of the local section of the Institution of the Rubber Industry), and Mrs. Brazier, Mr. and Mrs. Crosland, Mr. E. B. Hughes (Society of Public Analysts), and Mrs. Hughes.

The toast of "The Institute of Chemistry" was proposed by Mr. Creasey, and responded to by the President. The toast of "The Guests" was proposed by the Chairman of the Section, Mr. F. Scholefield, and responded to by Mr. J. Allan. Dr. O. R. Howell filled the post of M.C., and was assisted by an active staff of stewards. Dancing interspersed by cabaret turns followed and resulted in a most enjoyable evening.

Ramsay Chemical Dinner

A Plea for Rationalisation of Societies

THE eleventh Ramsay Chemical Dinner was held at the Central Station Hotel, Glasgow, on December 8. This dinner, which commemorates the memory of Sir William Ramsay, is held under the joint auspices of all the Glasgow Sections of chemical and allied societies.

Sir ARTHUR HUDDLESTONE occupied the chair and proposed the toast of the "Profession of Chemistry." Sir Arthur recounted some of his experiences in the Sudan and said that it was there that he first met real chemists. He had been amazed to hear it proposed to appoint a chemist to the State railways. However, he had been delighted to discover that the chemist, by examining all the coal used on the railways, had been able to effect savings much in excess of his salary. Irrigation schemes in the Sudan had also benefited by the work of chemists. Before the scheme was put in operation analysis of soil over a wide area were taken and a chemical survey map was drawn up. When the scheme was complete there were areas of low fertility and here again the chemist lent his aid by advising the correct manures to be used. An attempt to establish a natural indigo industry had been made but before the industry was properly started, the chemist produced synthetic indigo. The adjustment subsequent to the introduction of synthetic indigo had not been serious in the Sudan where the industry was only in its infancy, but other countries had not been so fortunate. It was one of the responsibilities of scientists that, by introducing new processes they tend to displace labour from old industries. This was a subject which Sir Arthur had not time to discuss fully but he said that it was his firm belief that, once the machinery of finance was again in full working order and the laws of supply and demand were following their normal course, the introduction of new processes would, in the long run, produce more work than they displaced. Adjustment would, however, be much more difficult in the future. Agricultural countries were becoming more and more industrialised and rationalisation was converting local industries into national and even international industries. Labour, too, was now less mobile due to social legislation. These difficulties could only be faced by more and more organisation and in this organisation the chemical societies would have to play their part. It was conceivable that they would have to be rationalised.

Professor G. T. MORGAN, president of the Chemical Society, replied to the toast. In his speech he outlined the growth of the Chemical Society and said that of the 44 presidents, about one-third had been Scotsmen. He also referred to the recent report on the Scottish chemical industries and said that he thought that it was rather pessimistic. The advances made in Scotland in the manufacture of dyestuffs had been remarkable. Scotland was greatly indebted to the Carnegie Trust, which in the last four years had financed the researches of between 70 and 80 students who had achieved a very high standard.

The toast of "The Guests" was proposed by Dr. WILLIAM CULLEN, and Dr. J. T. DUNN, president of the Society of Chemical Industry, replied.

Letters to the Editor

Manufacture of Egg Albumen

SIR,—Information as to the method of manufacturing egg albumen, with a reference to the firms likely to supply the necessary plant, will be much appreciated. Can you state, please, whether home or foreign eggs are normally used as the raw materials or if it is possible to buy the whites alone?—Yours faithfully,

CONTROLLER OF STORES.

Post Office Factory,
St. John's Road Depot, Dublin, C.13.

[We shall be pleased to pass on to our correspondent any information which readers may be able to furnish in response to the above inquiry.—ED. C.A.]

Damp Brick Walls

SIR,—I am a little surprised to see, according to the report under the above heading in THE CHEMICAL AGE of December 2, you state that there is no effective waterproofing available for damp brick walls and because the Building Research Board has tested a few waterproofers, it is suggested that there is no effective treatment for walls exposed to driving rain where penetration occurs by way of fine cracks formed between the brick and the mortar.

Surely you have overlooked the materials marketed by the Cement Waterproofing Co., Ltd. I have seen many buildings in the West of England which suffer through penetration of rain where the cause has unquestionably been this fine cracking, completely waterproofed by the Cement Waterproofing Co.'s materials and methods—and I know of buildings and structures in the Dominions which are subjected to tropical rains that have been made watertight by these methods. One of these buildings was the Union Building at Pretoria.—Yours faithfully,

J. C. MINERS.

Iddesleigh House,
Caxton Street, S.W.1.

THE Benoni Town Council has been approached by Baden and Co., Ltd., for a site in the industrial area, on which the company hopes to erect what is described as the largest factory for the production of kaffir corn malt. This site must adjoin that at present occupied by the company, which plans to enlarge its present factory to considerable dimensions.

Chemical Matters in Parliament

Insulin (Import Duty)

IN the House of Commons on December 11, Mr. George Hall (Aberdare) asked the President of the Board of Trade why the import duty on insulin had been increased from 10 per sent. to 33⅓ per cent.; and what would be the effect of this upon the price of imported insulin.

Mr. David Grenfell (Gower) also asked the President of the Board of Trade the amount of insulin imported into this country during the last convenient nine months; what was the world price at the beginning and the end of the selected period; what was the price of British insulin at corresponding periods; and whether, in increasing the import duty from 10 per cent. to 33⅓ per cent., consideration had been given to the additional cost that would have to be met by hospitals and sufferers from diseases for which insulin formed the basis of cure?

In reply, Dr. Burgin said a tribunal constituted under the Safeguarding of Industries Act, 1921, as amended by the Finance Act, 1926, had recently decided that insulin and its salts fell within one of the general descriptions of goods scheduled as liable to duty under that Act. Insulin, therefore, now became subject to the Key Industry Duty of 33⅓ per cent. ad valorem. No statistics of imports or of world prices of insulin were available, but he was informed that for some time past the retail price of insulin from one maker in this country had been 1s. 8d. per 100 units and from the other makers 2s. per 100 units. An undertaking had been given on behalf of the British makers that their prices would not be raised as a result of the new duty.

Mr. Grenfell then asked if there was any possibility that any advantage accruing to the producers would compensate for the disadvantages to the public health generally from the retention of high prices for this valuable medical substance.

Dr. Burgin said that, obviously, an opportunity must be given to consider the effects of the decision, but the undertaking that the price shall not be increased was a step in the right direction. Whether the price could be reduced was a matter which must be considered further.

Beet Sugar Industry

Sir H. Samuel (Lancaster, Darwen) asked the Chancellor of the Exchequer what was the total State assistance up to date in subsidy and revenue abatement, retained by the sugar-beet industry, calculated on the basis adopted in Table 79 of the Ministry's report on the industry, 1931?

In reply, the Financial Secretary to the Treasury (Mr. Hore-Belisha) said the total amount of State assistance from 1924 to date in subsidy and revenue abatement retained by the sugar-beet industry, calculated on the basis referred to, was £37,440,000.

Oil Extraction (Legislation)

On December 12, Mr. Joel (Dudley) asked the Secretary for Mines whether he proposed to introduce the Bill to give effect to the Government's oil-from-coal scheme before the Christmas recess; and, if not, what was the approximate date on which it was intended to introduce this measure?

In reply, Mr. E. Brown said he hoped to introduce this Bill before the Christmas Recess; but if this proved to be impracticable, it would be introduced immediately the House re-assembled.

British Celanese Works

Mr. Thorn (West Ham, Plaistow) asked the Home Secretary if he could state the number of firms adopting the same manufacturing process as that recently discontinued by the British Celanese works at Spondon, Derby, through the intervention of his Department; and whether he had issued a warning to these firms of the risks of continuing such a process or whether he had yet considered registering the process under the Workmen's Compensation Act?

In reply, Mr. J. Gilmour said this process was a peculiar one which, so far as the Factory Department was aware, was exclusively carried on by this firm. The second part of the question did not arise. He would consider the third point further in the light of the results of the investigations as to the nature of recent cases of illness.

New Dyestuffs Bill

On Wednesday, Mr. Walter Runciman, President of the Board of Trade, presented the Dyestuffs (Import Regulation) Bill, to amend and make permanent the Dyestuffs (Import Regulation) Act, 1920. The Bill was read a first time.

Manufacturing Chemists' Libel Action

Judgment for Defendants

IN the King's Bench Division on Tuesday, Mr. Justice Horridge and a special jury concluded the hearing of the action by Wynter Bros. and Co., Ltd., manufacturing chemists and druggists, of Low Green Works, Great Horton, Bradford, against Odhams Press, Ltd., of Long Acre, W.C., proprietors, printers and publishers of "John Bull," and Sir Wyndham Childs, to recover damages for an alleged libel contained in the issue of "John Bull" dated June 13, 1931. Sir Wyndham Childs was sued as the writer of the article complained of.

The plaintiffs' case was that the words complained of meant that they were dishonest traders, who saddled their customers with goods far in excess of the quality ordered, either by fraudulently altering the order itself, or by inducing the customer to sign the same by fraudulently representing that a less quantity had been inserted therein than was actually the case and that they had committed a criminal offence.

Defendants denied that the words complained of were capable of any defamatory meaning. They also pleaded justification and fair comment.

The previous proceedings have been reported in THE CHEMICAL AGE of December 2 and 9.

Mr. Norman Birkett, K.C., and Mr. Slade, appeared for the plaintiffs, and Sir Patrick Hastings, K.C., Mr. T. Mathew, Mr. P. B. Morle, and Mr. Cartwright Sharp, for the defendants.

For the defence, Mr. Geo. Arthur Mallinson, secretary of the Retail Pharmacists' Union, was called. He said the first complaint about the plaintiffs was received in 1926. There was correspondence with the plaintiffs. Similar complaints were received afterwards. To fulfil his duty to protect the members of the Union he inserted warnings abouts the plaintiffs in the Supplement published by the Union.

Cross-examined, Mr. Mallinson persisted in stating that Mr. Perry, one of the plaintiffs' travellers, had deliberately misled chemists into giving orders which they did not intend to give. He could not make any definite charges because he could not make them on his own personal knowledge and he might be making a charge which could not afterwards be substantiated. All he could say was that the members of the Union had told him that that was the trouble. He did not write to "John Bull" about this matter. They approached him. He did not instigate the article. At "John Bull's" request he furnished them with the material which he had. Personally, he was annoyed at outside interference in this matter, but he did not feel that he could possibly conceal from them the matter which he had.

Replying to his lordship, witness said that no other firm was in the same position as plaintiffs with regard to having complaints made against them.

The jury, after an hour's absence, answered the following questions as indicated:—Did the article impute dishonest trading to the plaintiffs?—Yes, substantially. If so, was it true?—Yes. Was the article otherwise defamatory?—Yes. If so, was it true?—Yes. If the article imputed dishonesty was the imputation a statement of fact or a comment?—Comment. If it was a comment, was it fair comment?—Yes. If the article did not mean that the plaintiffs were guilty of dishonest trading was it otherwise fair comment?—Yes.

Mr. Justice Horridge entered judgment for the defendants with costs.

Two other actions by Wynter Bros. against the "Shoe and Leather Record," Ltd., and others and Straker Bros., Ltd., and another, were postponed until after Christmas.

British Overseas Chemical Trade in November

Exports make a Notable Recovery

Exports of chemicals, drugs, dyes and colours during November were valued at £1,670,302, as compared with £1,429,795 for November, 1932, an increase of £240,507. Imports amounted to £1,003,553, as compared with £723,873; re-exports were £38,037, as compared with £32,428. For the eleven months ending November, 1933, the value of the exports has reached a total of £16,122,694, which is now £223,164 higher than the total for the corresponding period of 1932.

Imports

	Quantities. Month ended November 31, 1932.	Quantities. Month ended November 31, 1933.	Value. Month ended November 31, 1932. £	Value. Month ended November 31, 1933. £
Acetic anhydride .. cwt.	98	1,201	253	3,203
Acid, acetic .. ,,	17,220	12,700	29,661	20,453
Acid, tartaric, including tartrates .. cwt.	2,251	2,302	8,337	8,932
Bleaching materials ,,	7,514	4,423	12,094	8,030
Borax .. .. ,,	6,280	28,900	3,204	15,910
Calcium carbide .. ,,	75,208	102,021	42,481	61,611
Coal tar products, not elsewhere specified value	—	—	3,537	26,630
Glycerine, crude .. cwt.	—	—	—	—
Glycerine, distilled ,,	1,196	1,309	2,100	2,466
Red lead, orange lead ,,	1,287	1,425	1,513	1,323
Phosphorus .. ,,	1,083	5,115	4,544	10,956
Kainite, etc. .. ,,	67,889	130,241	12,362	20,127
Potassium nitrate (saltpetre) .. .. cwt.	9,209	9,650	7,157	9,164
Other potass. compounds cwt.	43,066	165,045	37,080	91,972
Sodium nitrate .. ,,	—	31,651	—	6,735
Other sod. compounds ,,	19,398	35,209	11,726	23,868
Tartar, cream of .. ,,	1,085	385	3,620	1,195
Zinc oxide .. tons	39	53	684	1,082
Other chemical manufactures .. .. value	—	—	221,933	205,313
Quinine, quinine salts oz.	90,492	84,895	9,760	6,377
Bark Cinchona (Bark Peruvian, etc.) .. cwt.	1,347	5,714	8,403	25,815
Other drugs .. value	—	—	86,880	135,600
Intermediate coal tar products used in dye manufacture .. cwt.	—	336	—	3,235
Alizarine and alizarine red cwt.	—	—	—	—
Indigo, synthetic .. ,,	—	—	—	—
Other finished dyestuffs ,,	3,189	3,979	67,235	107,569
Cutch .. .. ,,	1,233	1,050	1,542	1,162
Other dye extracts ,,	1,529	3,891	4,940	14,349
Indigo, natural .. ,,	2	—	54	—
Extracts for tanning ,,	64,723	85,478	46,991	58,594
Barytes, ground .. ,,	23,914	20,773	4,606	4,256
White lead (dry) .. ,,	5,543	8,559	6,760	10,353
Other painters' colours and materials .. cwt.	60,424	100,774	84,416	117,273
TOTAL .. value	—	—	723,873	1,003,553

Exports

	Quantities. Month ended November 31, 1932.	Quantities. Month ended November 31, 1933.	Value. Month ended November 31, 1932. £	Value. Month ended November 31, 1933. £
Acid, sulphuric .. cwt.	10,939	34,310	3,770	7,298
Acid, tartaric, including tartrates .. cwt.	1,080	1,575	3,501	6,948
Ammonium chloride tons	309	543	6,261	8,396
Ammonium sulphate ,,	26,009	30,924	120,111	195,802
Bleaching powder (chloride of lime) .. .. cwt.	56,502	61,784	16,918	16,301
COAL TAR PRODUCTS—				
Anthracene .. cwt.	—	4	—	5
Benzol and toluol gal.	7,348	16,112	756	1,889
Carbolic acid (crude) ,,	13,941	15,732	1,637	1,881
Carbolic acid (cryst.) cwt.	1,378	651	3,862	2,910
Cresylic acid .. gal.	91,513	135,496	8,569	12,324
Naphtha .. ,,	4,489	12,110	340	806
Naphthalene (excluding naphthalene oil) cwt.	5,921	11,131	1,598	3,855
Tar oil, creosote, etc. gal.	1,274,795	798,967	25,806	16,415
Other sorts .. cwt.	25,661	13,406	8,960	10,366
COAL TAR PRODUCTS value	—	—	51,528	50,451
Copper, sulphate of tons	827	1,736	12,635	25,169
Disinfectants, etc. cwt.	31,161	32,883	84,481	71,028
Glycerine, crude .. ,,	1,787	330	21,47	842
Glycerine, distilled ,,	9,902	18,893	20,031	37,871
Potassium chromate and bichromate .. cwt.	972	1,067	2,585	2,404
Potassium nitrate (saltpetre) .. .. cwt.	1,276	1,534	2,119	2,186
Other potass. compounds cwt.	5,316	3,077	8,995	8,032
Sodium carbonate, including crystals, ash and bicarbonate .. cwt.	247,777	277,718	68,765	79,270
Caustic soda .. ,,	154,957	166,168	109,717	99,575
Sodium chromate and bichromate .. cwt.	1,439	2,836	2,569	4,697
Sodium sulphate, including salt cake .. cwt.	83,845	54,160	8,605	5,928
Other sod. compounds ,,	107,315	114,388	97,285	101,538
Zinc oxides .. tons	927	1,521	18,967	29,140
Other chemical manufactures .. .. value	—	—	254,571	293,145
Quinine, quinine salts oz.	114,978	101,416	14,807	9,558
Other drugs .. value	—	—	235,646	271,232
Dyes and dyestuffs (coal tar) .. .. cwt.	8,672	8,732	77,924	98,441
Other dyestuffs .. ,,	18,318	21,875	15,656	18,536
Barytes, ground .. ,,	2,992	990	1,104	473
White lead (dry) .. ,,	2,247	3,312	3,799	5,898
Paints and colours in paste form .. .. cwt.	21,282	21,913	38,401	35,655
Paints and enamels prepared .. .. cwt.	25,724	33,089	73,925	96,557
Other painters' colours and materials .. cwt.	41,718	56,955	72,972	87,031
TOTAL .. value	—	—	1,429,795	1,670,302

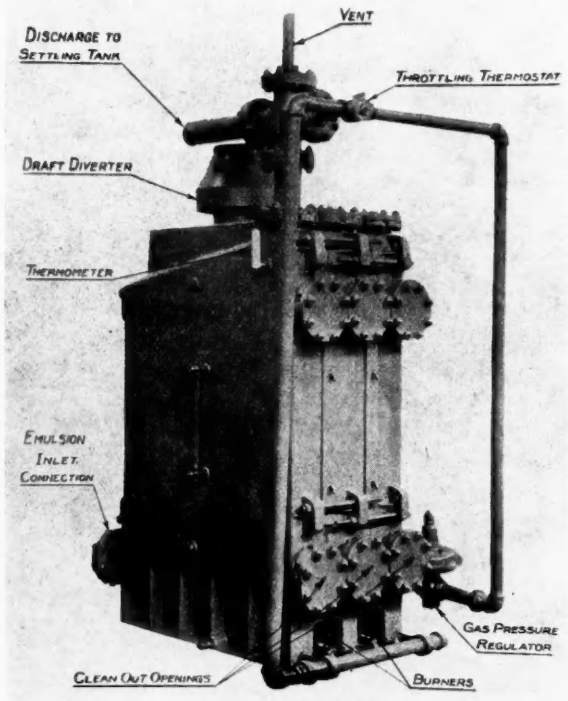
Re-Exports

	Quantities. Month ended November 31, 1932.	Quantities. Month ended November 31, 1933.	Value. Month ended November 31, 1932. £	Value. Month ended November 31, 1933. £
Acid, tartaric, including tartrates .. cwt.	68	76	446	449
Borax .. .. ,,	106	—	65	—
Coal tar products, not elsewhere specified value	—	—	4	1
Potassium nitrate (saltpetre) .. .. cwt.	88	55	136	106
Sodium nitrate .. ,,	80	690	58	305
Tartar, cream of .. ,,	189	127	819	468
Other chemical manufactures .. .. value	—	—	10,207	15,770
Quinine, quinine salts oz.	3,568	3,120	583	317
Bark Cinchona (Bark Peruvian, etc.) .. cwt.	222	83	2,298	347
Other drugs .. value	—	—	15,272	16,642
Cutch .. .. cwt.	69	206	95	252
Other dye extracts ,,	113	62	473	292
Indigo, natural .. ,,	2	13	56	272
Extracts for tanning ,,	427	1,193	485	896
Painters' colours and materials .. .. cwt.	280	359	731	721
TOTAL .. value	—	—	32,428	38,037

Works Equipment News

A New Demulsifying Unit

EMULSIFIED water in crude oil has long been a source of trouble to the oil producer. Sooner or later most wells produce water, generally emulsified with the oil. The emulsion usually becomes more difficult to break the longer the well has been producing, so that equipment changes have to be made to meet changes in emulsion requirements. Heating the oil is the general method of removing water. It is customary to use any available boiler as the heater, the heater usually being a steel tube boiler designed for coal firing, but which is heated with gas with resulting low efficiency.



The National Oil-Rator.

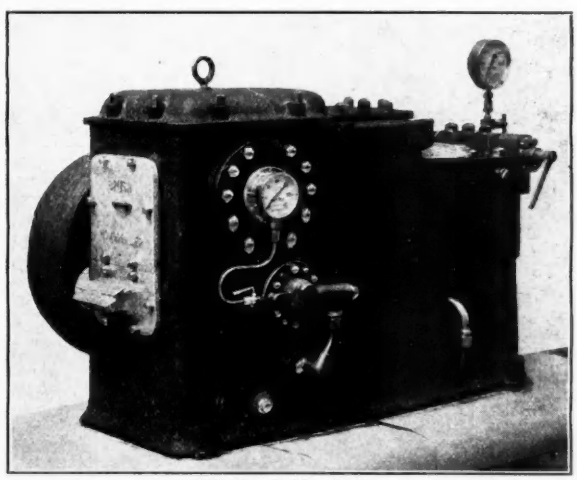
After extensive scientific investigation, the National Radiator Corporation, Johnstown, Pa., has announced the successful development of a new and efficient heater for demulsifying petroleum. A large oil company, realising the necessity for better equipment in coping with emulsion problems, requested the Corporation to construct a gas-fired heater that would be generally adaptable to removing water from oil at any well. The Corporation accordingly made a field study and found that at some wells it was necessary actually to boil the water out of the oil because the emulsion was so difficult to break, while at other wells the emulsion broke very easily at temperatures about 130° F. At some wells it was the practice to pass the oil through a heater, the emulsions at other wells could be broken by bubbling the oil through warm salt water. The production of the wells, of course, varied over wide limits. To meet practical requirements it was concluded that (1) a demulsifying heater must be so designed that it can be assembled and knocked down easily in the field, and all its parts must be light enough to be readily moved; (2) its throughput must be increasable at the will of the operator; (3) it must be efficient on widely different methods of removing water, whether hot oil or hot water is used; and (4) it must consist of a very limited number of castings.

It was found possible, after thorough experimental work, to incorporate all the above features in a heater that has the necessary highly efficient heat transfer, and that operates on waste gas produced by the wells. This heater consists of four types of castings; left and right end sections, a centre section, and a spacer bar. With these four castings, it is possible to set up quickly a heater of any desired size by merely adding more centre sections. The sections are held together by machined cast iron nipples and heavy bolts, making an oil-tight joint. The entire heater can be assembled in a few hours, and has already been used with success in several systems of breaking emulsions. It has been described in full in a report issued by the National Radiator Corporation.

Homogeniser with Novel Features

THE Brush homogeniser is designed and constructed for use in the dairy, chemical and other industries whose manufactures call for fluid mixtures which must not separate out after the passage of time. Such mixtures are produced from ordinary fluid mixtures by pumping through small orifices at a very high pressure, up to 4,000 lb. per sq. in., thus reducing the solid or liquid particles to such a size that the mixture becomes a true or colloidal emulsion or suspension, or an emulsion or suspension in which the rate of separating out is extremely slow.

The Brush homogeniser, manufactured by the Brush Electrical Engineering Co., Ltd., has many advantages. It is extremely compact; it requires less attention than any other; there are only half the number of joints; its life is longer than that of any other, as the bearing pressures are halved; and it requires less power to achieve its results, as valve inertia is reduced. It can be supplied either self-contained with its own motor, or with belt drive, and can therefore be placed at any point most convenient in the works. Stainless materials are used throughout where contact is made with the



The Brush Homogeniser.

homogenised fluids. Adjustment of pressure, etc., is simple, and can be made while the homogenising is in process. Finally, the machine is easily cleaned, and can, if necessary, be hosed down.

In construction this homogeniser consists of a three-throw pump delivering the working fluid under pressures adjustable up to 4,000 lb. per sq. in., through the homogenising valve to the delivery reservoir. The pump is of the three-throw type, giving a continuous flow. The cylinder block is machined from a stainless steel forging, and both valves and plungers are made from stainless materials. Each plunger, which is made of chromium-plated steel, is driven through an accurately machined cross-head and connecting-rod from one

of three eccentrics on the low-speed shaft. Ample clearance is provided around the plungers, leakage being minimised by the fitting of S.E.A. rings, especially designed for use with liquid foodstuffs and similar materials at high pressures; while the plunger rods work through water-scaled lantern rings, the water not only washing the rods, but providing evidence of any leakage which may take place. A dividing ring is also fitted to each plunger to prevent creepage of lubricating oil into the cylinders and consequent contaminations of foodstuffs. The homogenising valve and seat are of materials which are resistant to corrosion and erosion. The valve is not spring-loaded in the usual way, but is opened by the action of the high-pressure liquid in expanding a stainless steel tube and compressing a rod which is inside it. The initial compression of the rod can be adjusted from outside without the necessity of a gland. The machine illustrated delivers 500 to 750 gal. per hour at crank-shaft speeds of 100 to 150 r.p.m.

Dust Removal and Drying

MECHANICAL ventilation is a branch of engineering which is steadily coming to the fore and the modern employer realises that clean and healthy conditions in his factory contributes in no small measure to the manufacture of a high standard of efficiency in production and a considerable reduction in absences through illness. Brierley, Sons and Co. have had a large and varied experience in all classes of dust and fume removing from manufacturing processes with efficient results. Fig. 1 shows a dust removal equipment as supplied to rubber rolls and mixers in which dangerous and irritating dusts are created, similar plants have been supplied to chemical works for the suppression of dust in the manufacture of poisonous products such as arsenic compounds and lead oxide, also alum, root and bark grinding.

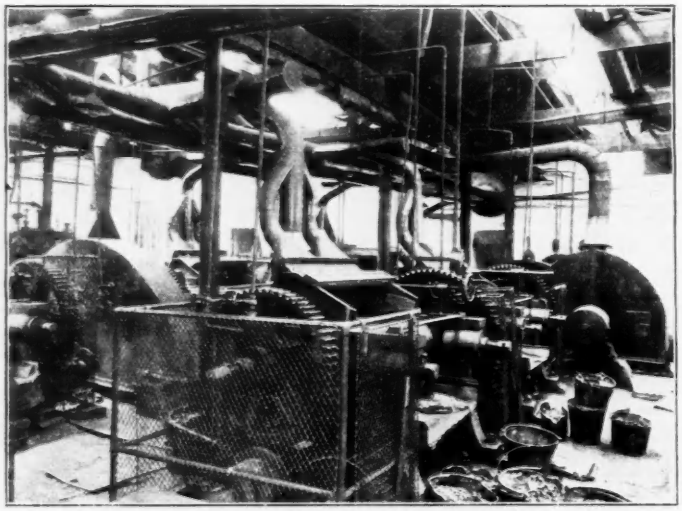


Fig. 1.—Brierley Dust Removal Plant for Rubber Mixing Mills.

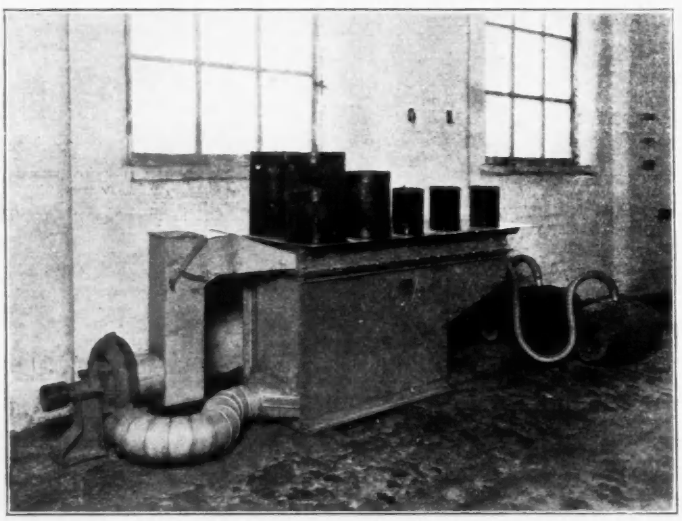


Fig. 3.—Combined Drum and Barrel Drying Machine.

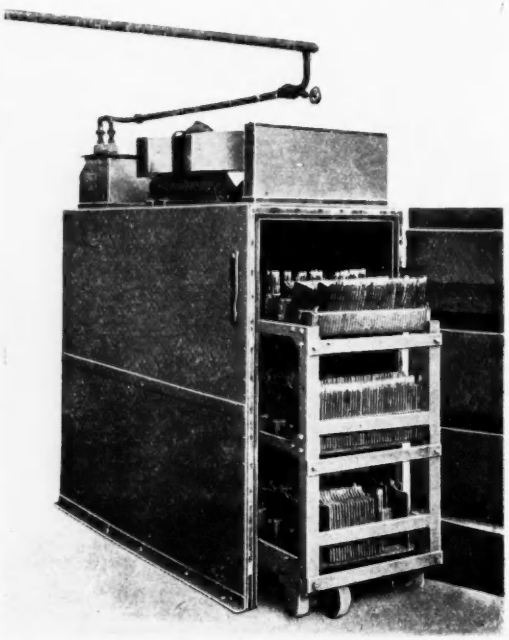


Fig. 2.—Small Steam-Heated Unit Dryer.

The drying of materials has also engaged the attention of this firm. Fig. 2 shows a small steam heated unit dryer which has been adapted for the drying of accumulator plates, powders, crystals, etc. The casing is of double mild steel with asbestos filing to prevent heat losses, the fan circulates hot air very rapidly and dampers are fitted to allow fresh air admittance and moist air discharge. Fig. 3 shows a compact dryer for chemical containers and barrels, after being cleaned with a steam jet the containers are placed inverted on the top of a casing, stream of high velocity hot dry air is forced into containers or into the bung of the barrel.

Electrical Breakdowns

THE modern factory depends for its output on the electric motors which drive the machines. It is, therefore, of the utmost importance that the condition of the insulation of these motors should at all times be perfect. The electrical engineer's choice of insulating materials, while it has been extended of recent years, is limited, and the properties of some of the materials that have to be used are not always mechanically satisfactory. He needs, therefore, to be constantly alert for faults in the electrical system which may be brought about by accidental damage or through deteriora-

tion due to damp, dirt, or other causes. Troubles often develop very gradually and are rarely visible in the earliest stages. For this reason it is very necessary in the interests of the safe and uninterrupted running of plant to test the insulation when first installed and for the maintenance man to make regular routine tests in order that the plant may be kept in good order.

In a well organised works this is now done as a matter of course, but up to the present time very little has been written on detailed methods of carrying out these tests, or on the location of faults after a first test has revealed that the insulation resistance is unsatisfactory. Recently, however, Evershed and Vignoles, Ltd., announced the publication of a practical book on insulation testing entitled "How to Avoid Electrical Breakdowns." This book, which is of pocket size, is illustrated by diagrams which supply the electrical man with just the kind of information he requires in every-day practice. It gives simple instructions for carrying out tests on motors, generators, domestic apparatus, house wiring installations, etc. A chapter on the use of Megger instruments is included in the book and some interesting notes appear on testing circuits where capacity is present.

Weighbridges for Any Load

WEIGHBRIDGES for any load and for every type of traffic are supplied by the Whessoe Foundry and Engineering Co., Ltd. These weighbridges are installed throughout the heavy industries of Britain where accuracy is essential. They will be found at gasworks, chemical works, soap works, oil depots and other places where weighings are continually taking place. A new leaflet recently issued tabulates standard sizes for road purposes, for railway wagons and for combined road and rail traffic. One of the illustrations in this leaflet shows a combined weighbridge for both road and rail traffic with a steelyard arranged to weigh to 40 tons: the carrying capacity of this machine is 60 tons for railway wagons and up to 30 tons for road vehicles.

Heat Treatment for Metals

THE Incandescent Heat Co., Ltd., are specialists in the design and manufacture of all types of industrial furnaces and equipment incidental thereto for metallurgical, general engineering, chemical, ceramic and other industries. Their range of furnaces covers gas, oil, electric, producer gas and coal-fired furnaces, together with charging machines, quenching plants, conveyors, gas producers, drying plants, melting and liquid bath furnaces, mechanical equipment, mill gear, pyrometers, automatic controllers, etc. The leading steel companies throughout Great Britain have installed large batteries of Incandescent Heat furnaces and equipment, which in all cases have been designed for, and attain in practice, the production of materials of the highest possible finish under conditions of economic operation. The company has recently issued a brochure which illustrates many of these installations. They maintain an extensive research department in which are evolved the latest forms of apparatus and equipment to meet the changing requirements, advances and improvements in industry generally.

Plunger Valves

PATENT "Twintite" plunger valves, as manufactured by Gummers, Ltd., are illustrated in a new list issued by this firm. By virtue of their unique steam-tightness and durability in service, these valves are adopted as standard by many of the larger steam users. These advantages are emphasised where conditions are most severe, but for easy conditions the valves are undoubtedly inexpensive, as their period of service is considerably longer than other types, and their cost is comparable with any other high class valves. Special mention must be made of the fact that there are no ports in the plungers of the valves. Hollow or ported plungers cause trouble through the high velocities set up at the moment of closure, and it is only since the introduction of the solid plunger that this type of valve has become a practical success. The flow of steam is checked and cut off by the plunger whilst the mushroom valve is well removed from its seating whenever any steam is flowing. The seat ring is free from distortion trouble and is not affected by expansion or contraction of the valve body or pipe line; it is cushioned by the asbestos seat ring beneath it, against pressure exerted by the valve spindle. Distortion troubles are thereby eliminated.

Crushers for Glass Work

THE Hadfield granulator is a jaw type breaker and is an admirable machine for crushing the hardest substances down to a comparatively fine product. The body is made of steel in one solid piece, and the crushing jaws are of Hadfield's patent "Era" manganese steel. Several sizes are made, but the 10 in. x 3 in. and 12 in. x 4 in. machines are those in general use for crushing "cullet" at glass works. The 12 in. x 4 in. granulator, when set to break down to ¾ in. ring, has a capacity of about 4 tons of crushed "cullet" per hour. For reducing "cullet" in large quantities, gear driven crushing rolls, fitted with renewable toothed roll shells are employed.

The hard character of glass and the resistance offered in breaking it down into small pieces require powerful machines

The Hadfield Solid Steel Granulator.

of heavy construction to deal with it. Moreover, the destructive effects of the glass on the components that do the actual crushing demand for these parts a material of exceptional durability. Hadfields, Ltd., have had long experience in all classes of crushing work, and they build crushers to deal with the hardest rock that is mined. Their success in this field of activity, undoubtedly, is due to the extensive use they make of steel for the structural parts of their machines, and the employment of "Era" manganese steel for the actual crushing members. "Era" manganese steel, of which Hadfields are the inventors and sole makers, has all the attributes of hard steel without its brittleness, and this combination of hardness and toughness has brought it into universal use for parts of machinery, especially crushing machines, that are subjected to abnormal wear and excessive abrasive action.

Indian Academy of Science

IT has been tentatively decided to establish an Indian Academy of Science for the promotion and advancement of scientific research in India, capable of co-ordinating research and safeguarding the interests of scientific workers. All departments of science, both pure and applied, will be included, and allowed effective representation in its constitution. With a view to ensuring co-ordination of research, it has also been decided that the existing scientific bodies in India should be represented. This will enable scientific knowledge in the country to be pooled and applied to the practical needs of the people. The proposal for an academy started from Calcutta, but will be placed before a special meeting of the general committee of the Science Congress at its forthcoming session at Poona.

New Technical Books

VOLUMETRIC ANALYSIS. By G. Fowles. pp. 202. G. Bell and Sons, Ltd., 6s. net.

This book presents an elementary survey of volumetric analysis from a theoretic and practical standpoint as applied to the estimation of common metals, acid radicals and familiar organic compounds. Chapter I. deals with the preparation based on first principles of a standard solution of an acid and one of a base; this section is available separately under the title of " Introduction to Volumetric Analysis " (price 1s. 4d.). Typical neutralisation processes are then treated in detail, the principle of the determination is explained, the volumetric technique is introduced as required, and the method of calculating the result shown. Succeeding chapters cover oxidimetry, wilometry, and precipitation processes. There is a useful table showing the solubilities of bases and salts in water at 18°, and also a chapter on accuracy and associated matters.

* * *

INTRODUCTION TO PHYSICAL CHEMISTRY. By Alexander Findlay. pp. 492. Longmans Green and Co. 7s. 6d.

Owing to the rapid advances made in recent years by physical science some difficulty would naturally be experienced in selecting the subjects suitable for an introductory course of physical chemistry. In this book the author has adopted the historial method of treatment. He points out that an acquaintance with the historial development of a subject is necessary for a true understanding and appreciation of its present state. The book, moreover, has been specially written to meet the needs of the student who desires to build his later specialised study on a broad foundation. Numerical problems are worked out in the body of the text and a number of problems for solution by the student are collected together in an appendix. The early chapters deal with the constitution of matter, the properties of gases, liquids and crystalline solids, the liquefaction of gases and critical phenomena. This is followed by a study of dilute solutions and their collegative properties, and the behaviour of electrolytes in solution. Still later chapters are concerned with thermochemistry, homogeneous equilibria, the velocity of chemical reaction, catalysis, the law of mass action applied to solutions of electrolytes, chemical energy and electrical energy, photochemistry, the phase rule, adsorption and the colloidal state.

MASS-SPECTRA AND ISOTOPES. By F. W. Aston. pp. 248. Edward Arnold and Co. 15s.

This book incorporates the substance of lectures delivered at the University College of Wales, Aberystwyth, during the session 1931-32. Part I is historical; Part II deals with the production and analysis of mass-spectra; Part III, the elements and their isotopes; Part IV covers the electrical theory of matter, isotope statistics, isotope effect in molecular and atomic spectra, and the isolation of isotopes. The rapid development of artificial transmutation of elements appears likely to create a demand for collected data of this type in an easily accessible form.

* * *

THE TERPENES. Vol. II. By J. L. Simonsen. pp. 627. Cambridge University Press. 35s.

In the first section of this volume the chemistry of the dicyclic terpenes and their derivatives are surveyed; the second section is devoted to sesquiterpenes. Few, if any, natural products have formed the subject of such intensive study as the pinenes and camphor. Although it is impossible, within the limits of a monograph, to refer to every memoir, it is hoped that no investigations of importance have been omitted. Special importance attaches to Section II in view of the close relationship of the sesquiterpenes to many substances of outstanding biological interest. It is within the last decade that the chemistry of this group of terpenes has been gradually elucidated.

* * *

MODERN METHODS IN QUANTITATIVE CHEMICAL ANALYSIS. By A. D. Mitchell and A. M. Ward. pp. 178. Longmans, Green and Co., Ltd., 6s. net.

This book purports to function as a supplement to the more standard textbooks on analytical chemistry by including methods which have been introduced or perfected within the last decade or so, but electro-metric and other physical methods are not included since the descriptions of the technique involved is precluded by considerations of space. The great majority of the processes described have been worked out by the authors under specified conditions, but they have not hesitated to introduce modifications which they have found desirable. Research workers, as well as students, will find many helpful suggestions in these pages when faced with the problem of selecting a convenient method of analysis outside the range of their normal analytical requirements.

British Chemical Standards

Four New Specifications

BRITISH Standard Specifications have been issued for acetone, ethyl alcohol, butyl alcohol and methyl alcohol. Limits are laid down in the specifications for specific gravity, distillation, acidity, alkalinity, etc., while standard methods of test for determining these properties are included in appendices. These specifications are the first to be issued by the committee of the recently formed Chemical Division which has been actively working for the past year under the chairmanship of Dr. J. Varges Eyre preparing a comprehensive series of nationally agreed standards for solvents.

Details of the tests adopted have been arrived at as the result of much careful criticism of the available methods of analysis, particularly from the point of view of degree of accuracy and reliability, and much experimental work has been carried out by members of the committee in the practical verification of these methods. In fixing the limits, there has been close consultation and discussion between the principal users and manufacturers of the articles dealt with in the specifications. Other specifications are nearing completion for acetic acids, ether, acetates, phthalates, diacetone alcohol, hexachlorethane, etc. Copies of these new specifications (Nos. 506, Methyl Alcohol; 507, Ethyl Alcohol; 508, Normal Butyl Alcohol; and 509, Acetone (all 1933)) may be obtained from the Publications Department, British Standards Institution, 28 Victoria Street, S.W.1 (2s. 2d. each, post free).

Royal Society of Arts

Competition of Industrial Designs

THE Royal Society of Arts has issued its report on this year's competition of industrial designs. In consequence of the heavy costs incurred by the Society in organising these competitions, the council has, in spite of their success as shown by the increasing number of entries during the past ten years, reluctantly been compelled to suspend the arrangements for future competitions of industrial designs until help from other sources and the necessary funds are available. It will not, therefore, be possible to hold a competition in 1934.

Ten competitions for designs for architectural decoration, textiles, furniture, pottery and glass, book production, posters and showcards, silverware and leatherwork have been held since 1924, and travelling scholarships and prizes of the total value of £11,500 have been awarded to young students, designers and craftsmen. The Society is grateful to the various city companies, municipal corporations, trade associations, manufacturers and others who have contributed the scholarships and prizes which have been offered in connection with the competitions. It also expresses the gratitude of the Society to the members of the various committees, the judges, the governing bodies and staffs of the Imperial College of Science and Technology, and the Imperial Institute, the principals and staffs of schools of art and kindred Institutions, and other friends for services rendered to the competition.

News from the Allied Industries

Safety Glass

NOTICE OF A FIRST AND FINAL DIVIDEND of 2s. in the £ by Safetex Safety Glass, Ltd., appeared in the "London Gazette" of December 12.

Artificial Silk

MENTION OF THE PROSPECTS of Courtaulds, Ltd., erecting an artificial silk factory at Ribbleton, Preston, was made at a Ministry of Health inquiry into an application by Preston Corporation for sanction to borrow £30,500 for sewerage works. The town clerk (Mr. H. E. Nutter) said 1,423 acres would be added to the borough next April under the recent review of county districts, and of this 184 acres had been acquired by Courtaulds. The object of the application was to put down a 36 in. sewer for the purpose of draining this additional land. When Courtaulds erected a factory—and the Corporation sincerely hoped they would in the near future—a new sewer would be required for dealing with the effluent.

Non-Ferrous Metals

THE FULL TEXT of the agreement for the international control of tin, which was signed on behalf of five Governments in London, on October 27 last, was published on December 9. As already announced, the scheme, which provides for a continuance of control over production and export, will continue in operation for three years from January 1, 1934, and may be extended for a further period or periods. Any such extension shall be considered at least twelve months before the date on which the scheme would otherwise cease to operate. The agreed standard tonnages are:—Bolivia 46,490 tons. Malay States 71,940, Netherland East Indies 36,330, Nigeria 10,890, giving a total of 165,650 tons. The Government of Siam agrees that its annual export, calculated on the basis that the ore contains 72 per cent. of metal, shall not exceed 9,800 tons; provided that, if and when the export quotas of the four other countries reach 65 per cent. of the agreed standard tonnages, any percentage increase in the export quotas shall be applicable to Siam.

Iron and Steel

THE PROPOSED MERGER between Dorman, Long and Co., and the South Durham Steel and Iron Co., Ltd., has been abandoned.

DORMAN, LONG AND CO., LTD., have issued to their stockholders details of a scheme for a temporary loan of £300,000 during the proposed moratorium period. The circular states that this step is necessary in view of the current increase in business, and to make provision for increased facilities for general working. The capital scheme depends upon the stockholders agreeing to certain conditions.

A FURTHER REDUCTION IN PROFIT is announced by the South Durham Steel and Iron Co., Ltd., for the year ended September 30 last, and no dividend is to be paid on the ordinary shares. A year ago the distribution on the ordinary share capital was 3 per cent., and for 1930-31, 4 per cent. was paid. The directors state that unfavourable conditions in the shipbuilding industry referred to by the chairman in his annual addresses to the shareholders in previous years have continued, and the very small demand for ship plates has again seriously affected the profits.

THERE WERE SEVENTY-NINE FURNACES in blast at the end of November, an increase of five during the month. Production of pig-iron in November amounted to 374,900 tons, compared with 373,300 tons in October, and 267,700 tons in November, 1932. The daily rate of operation thus showed an increase of nearly 4 per cent. between October and November. The production includes 102,400 tons of hematite, 178,300 tons of basic, 77,600 tons of foundry, and 9,600 tons of forge pig-iron. The output of steel ingots and castings in November amounted to 695,000 tons, compared with 668,300 tons in October, and 473,800 tons in November, 1932.

Rubber

THE AVON INDIA RUBBER CO., LTD., held their 44th annual meeting at Melksham, Wilts, on December 6. Major R. F. Fuller, J.P. (chairman), in moving the adoption of the annual report and accounts, said that the net profits amounted to over 12 per cent. on the increased ordinary capital, and £56,145 had been spent on additional plant and improvements to cope with expansion of trade. Further boiler power had already been ordered, and an additional mixing mill of 75 tons per week capacity. He also referred to the conversion of the company to a public company and the arrangements for placing additional capital.

Paper

A SETTLEMENT OF THE ACTION brought by Severn Kraft Mills (1928), Ltd., of Portishead, Bristol, against Charles Walmsley and Co., Ltd., of Bury, Lancs., for alleged breaches of contract for the supply of equipment for the making of M.G. Kraft paper, was announced in the High Court on December 13, the twenty-third day of the hearing. Evidence was still being given for the plaintiffs when Mr. Mortiz, K.C., intimated that counsel desired to have a consultation. The Court accordingly adjourned for a few minutes, and when the sitting was resumed, Mr. Moritz said he was happy to be able to inform the Court that it would not be further troubled with this long and difficult inquiry. The parties had considered the matter, and as a result the record would be withdrawn on terms agreed, and all allegations and claims on both sides would be unreservedly withdrawn. All parties were deeply grateful to the Official Referee for the patience and courtesy with which he had heard the case. Mr. Derbyshire, K.C., for the defendants, endorsed what had been said by Mr. Moritz.

Sugar

SPEAKING at the annual general meeting of Tate and Lyle, Ltd., held in London, on December 7, Sir Ernest W. Tate said that during the past year nearly 800,000 tons of raw sugar produced within the Empire have been melted by the company. He also referred to the reorganisation of our Liverpool refineries. This work is well in hand, and although it will not be complete for a year or more, has already shown great advantages, which confirm the company's opinion that, when complete the Love Lane Refinery will be second to none in the world. The directors, he added, have decided to pay for this reorganisation to a large extent out of profits. At the request of the Government satisfactory arrangements have already been concluded between the British refiners and the home grown beet producers, which have as their object the elimination of wasteful competition, and although nothing has been done which will increase the price of refined sugar to the public above that which is justified by the world's price, it is hoped that unnecessary losses due to uneconomic marketing will be avoided in the future.

Returning Prosperity

The Trend of Vital Statistics

ALL the vital statistics move in the right direction. The unemployed are 623,000 less than they were at the beginning of the year. The Board of Trade returns exhibit a rather better position, if we accept the strange modern theory of the balance of trade. But home business is unquestionably on the move in the right direction. Railway figures, and such extension schemes as the electrification of the Southern line to Eastbourne, are infallible indications of confidence and returning prosperity. Even the revenue returns look better. A reduction of expenditure of £53,000,000 in eight months gives good ground for satisfaction. True, £52,000,000 of the £53,000,000 has come straight out of the pockets of the rentier class by way of reduction of interest payments, but provided that saving is justly allotted where it belongs, to the reduction of taxation, there is no reason to doubt the general improvement in the situation.—"The Independent."

Inventions in the Chemical Industry

Specifications Accepted and Applications for Patents

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Specifications Accepted with Dates of Application

COLORATION of cellulose ester and ether materials.—British Celanese, Ltd., G. H. Ellis and F. Brown. Feb. 17, 1932. 402,391.

DYEING of materials.—British Celanese, Ltd., G. H. Ellis and F. Brown. Feb. 17, 1932. 402,392.

COLORATION of cellulose ester and ether materials.—British Celanese, Ltd., G. H. Ellis and F. Brown. Feb. 17, 1932. 402,393.

IONISATION and electronisation of mixtures of gases and other materials, such as vapours, liquids, colloids, solids, process.—R. C. Sabot. March 18, 1931. 402,419.

ALUMINOUS MATERIALS, treatment.—W. B. Llewellyn and P. Spence and Sons, Ltd. Feb. 29, 1932. 402,410.

ACTIVE PRINCIPLES of hormones, process for preparing.—Allen and Hanburys, Ltd., N. Evers and C. J. Eastland. March 4, 1932. 402,433.

ETHYLENE OXIDE, particularly for the preparation of ethyleneglycol and of its derivatives, production.—Soc Française de Catalyse Generalisee. Oct. 3, 1931. 402,438.

VITREOUS SILICA WARE, production.—F. L. Clark and Imperial Chemical Industries, Ltd. May 26, 1932. 402,400.

CHLORINATED RUBBER PRODUCTS, production.—W. D. Spencer and Imperial Chemical Industries, Ltd. June 2, 1932. 402,454

PHOTOGRAPHIC SENSITISERS.—I. G. Farbenindustrie. June 5, 1931. 402,458.

ALIPHATIC ANHYDRIDES, manufacture.—H. Dreyfus. June 4, 1932. 402,462.

ADSORPTION of gases or vapours.—Silica Gel Corporation. June 8, 1931. 402,479.

ANTHRAQUINONE DERIVATIVES, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). June 23, 1932. 402,505.

IMPREGNATING, dressing, polishing and like agents, production. J. Y. Johnson (I. G. Farbenindustrie). June 30, 1932. 402,513.

DYES and sensitised photographic emulsions, manufacture.—I. G. Farbenindustrie. July 11, 1931. 402,521.

BENZOIC ACID and benzoates, production.—Bozel-Maletra Soc. Industrielle de Produits Chimiques. June 23, 1932. 402,529.

PROCESS and apparatus for freezing homogeneously liquid and semi-liquid organic substances for their preservation as well as transport in a frozen condition.—E. Kuusik. Oct. 20, 1932. 402,581.

MULLITE, production.—General Ceramics Co. Nov. 6, 1931. 402,588.

ALCOHOLS, manufacture.—Air Reduction Co., Inc. Feb 8, 1932. 402,613.

FATTY OILS, processes of preparing.—Standard Oil Co. April 4, 1932. 402,651.

HIGHLY ACETYLATED CELLULOSE ACETATES, production.—A. H. Stevens (E. Berl). June 23, 1933. 402,692.

Complete Specifications Open to Public Inspection

APPARATUS for washing and purifying gases.—Ateliers J. Hanrez Soc. Anon. May 31, 1932. 20601/32.

ALUMINIUM SILICON alloys and methods of manufacturing the same.—Aluminium, Ltd. June 2, 1932. 2137/33.

RUBBER, treatment.—Naugatuck Chemical Co. June 4, 1932. 5977/33.

COLOURING BODIES and pigments, production.—Dr. A. Sander. June 3, 1932. 12946/33.

CONCENTRATING Phosphate-bearing materials, processes.—Phosphate Recovery Corporation. June 2, 1932. 14446/33.

BERYLLIUM or alloys thereof and a process of fusing the same.—Beryllium Corporation. May 28, 1932. 14762/33.

OXALIC ACID, process for preparing.—Consortium für Elektro-Chemische Industrie Ges. May 30, 1932. 14842/33.

DYEING BONES or objects made therefrom, process.—Soc. of Chemical Industry in Basle. June 3, 1932. 14891/33.

POTASSIUM OXALATE from potassium formate, process for making.—Dr. E. Hene. May 30, 1932. 15289/33.

CONCENTRATED NITRIC ACID, process for the production.—Lonza Elektricitätswerke und Chemische Fabriken Akt.-Ges. June 4, 1932. 15204/33.

DYESTUFFS of the triarylmethane series, process for the manufacture.—I. G. Farbenindustrie. May 30, 1932. 15494/33.

WETTING AGENTS and like substances, manufacture.—E. I. Du Pone de Nemours and Co. May 28, 1932. 15523/33.

DYEING FURS, process.—Soc. of Chemical Industry in Basle. June 2, 1932. 15862/33.

MOISTURE PROOFING and moisture-proofed materials.—Sylvania Industrial Corporation. June 4, 1932. 15878/33.

HEAVY METAL SALTS of polymeric carboxylic acids, manufacture of shaped articles from.—I. G. Farbenindustrie. June 2, 1932. 15864/33.

DIPHENYLAMINE SULPHONE series, process for the manufacture of compounds of.—I. G. Farbenindustrie. June 2, 1932. 15896/33.

CHEMICAL MANUFACTURE.—Mathieson Alkali Works. June 4, 1932. 15912/33.

CELLULOSE ESTERS, manufacture.—E. I. Du Pont de Nemours and Co. June 2, 1932. 16029/33.

OXAZINE DYESTUFFS, manufacture.—I. G. Farbenindustrie. June 4, 1932. 16234/33.

Applications for Patents

INTERMEDIATE COMPOUNDS for manufacture of dyestuffs.—Imperial Chemical Industries, Ltd., and A. Kershaw. Nov. 15. 31844.

PULVERISING MILLS for reduction of mineral ores, etc.—Isherwoods, Ltd. Nov. 14. 31764.

WATER SOFTENERS.—W. H. Kimpton and J. C. Russell. Nov. 11. 31501.

HYPOCHLOROUS ACID, preparation of aqueous solutions.—G. Ornstein. Nov. 9. (Germany, Nov. 11, '32.) 31284.

CATALYSTS and catalytic processes.—J. Swinburne. Nov. 11. 31463.

POROUS heat-insulating body.—Babcock and Wilcox Co., and A. P. Thurston. Nov. 20. 32307.

COLOURATION of textile materials.—British Celanese, Ltd. Nov. 17. 32074.

ORGANIC SUBSTANCES, manufacture.—British Celanese, Ltd., W. H. Groombridge, R. J. Peek. Nov. 20. 32285.

SYNTHETIC RESINS, etc., manufacture.—British Celanese, Ltd., and W. H. Moss. Nov. 22. 32583.

STABILISATION of motor fuels.—R. G. Clarkson, and E. I. Du Pont de Nemours and Co. Nov. 16. 31990.

ODOROUS CHEMICAL COMPOUNDS, manufacture.—Descollanges Frès Soc. Anon. Nov. 16. (France, Nov. 16, '32.) 32025.

VULCANISING RUBBER, and accelerators therefor.—Dunlop Rubber Co., Ltd., D. J. Hadley, F. A. Jones, and D. F. Twiss. Nov. 17. 32062.

AZO DYESTUFFS, production.—E. I. Du Pont de Nemours and Co., and H. E. Woodward. Nov. 17. 32078.

STABILISATION of aqueous formaldehyde solutions.—E. I. Du Pont de Nemours and Co., and J. F. Walker. Nov. 21. 32463.

FURFURANE, etc., hydrogenation.—E. I. Du Pont de Nemours and Co., and W. A. Lazier. Nov. 22. 32607.

SYNTHETIC LUBRICATING OILS.—I. G. Farbenindustrie and J. Y. Johnson. Nov. 17. 32084.

AZO DYESTUFFS on fibre, producing.—I. G. Farbenindustrie. Nov. 16. (Germany, Nov. 17, '32.) 31992.

NITROARYLAMINO-ARYLAMINES, manufacture.—I. G. Farbenindustrie. Nos. 16. (Germany, Nov. 17, '32.) 31993.

WATER-SOLUBLE DERIVATIVES of vat dyestuffs, etc., manufacture.—I. G. Farbenindustrie. Nov. 17. (Germany, Nov. 18, '32.) 32102.

DYESTUFFS, manufacture.—I. G. Farbenindustrie. Nov. 20. (Germany, Nov. 18, '32.) 32341.

OXYETHYLATED (β, γ-dioxypropyl) aminobenzenes, manufacture. I. G. Farbenindustrie. (Germany, Dec. 24, '32.) 32486.

FIREPROOF MATERIAL, manufacture.—I. G. Farbenindustrie. Nov. 21. (Germany, Nov. 22, '32.) 32500.

OXYETHYLATED (γ-alkoxy-β-oxypropyl)-aminabenzenes.—I. G. Farbenindustrie. Nov. 22. (Germany, Feb. 15.) 32639.

DRYING GRASS.—Imperial Chemical Industries, Ltd. Nov. 17. 32079.

ANHYDRIDES of aliphatic monobastic acids, manufacture.—Imperial Chemical Industries, Ltd., and L. Rubenstein. Nov. 20. 32291.

INTERMEDIATES and azo dyes therefrom, manufacture.—Imperial Chemical Industries, Ltd., and W. A. Sexton. Nov. 21. 32462.

FUNGICIDAL BODIES, manufacture.—Imperial Chemical Industries, Ltd., and F. L. Sharp. Nov. 22. 32608.

FILTERING APPARATUS.—M. Vogel-Jorgensen. Nov. 20. 32384.

DECOMPOSITION of nitrosyl chloride.—Kali-Forschungs-Anstalt Ges. Nov. 22. (Germany, Feb. 2.). 32641.

RECOVERY of sulphuric acid by condensation.—Metallges Akt.-Ges. Nov. 20. (Germany, Nov. 19, '32.) 32378.

RECOVERY of sulphuric acid by condensation.—Metallges Akt.-Ges. Nov. 20. (Germany, March 11.) 32379.

MAGNESIUM hydroxide skin powder.—C. H. Phillips Chemical Co. Nov. 16. (United States, Nov. 17, '32.) 32009.

HEAT INTERCHANGERS.—Yorkshire Tar Distilleries, Ltd. Nov. 20. (Nov. 22, '32.) 32363.

INSECTICIDAL, etc., compositions.—Alox Chemical Corporation and C. Lean. Nov. 25. 32996.

REFINING METALS by vacuum at high temperatures.—American Smelting and Refining Co. Nov. 24. (Germany, Dec. 1, '32.) 32924.

PURIFICATION of water.—A. A. M. Bado. Nov. 27. 33222.

COMBINED CRACKING and distillation of carbonaceous materials. E. W. Blocklebank and H. Lander. Nov. 28. 33356.

SULPHUR DYESTUFFS, manufacture.—A. Carpmael and I. G. Farbenindustrie. Nov. 23. 32777.

SPINNING of glass threads.—Chance Bros. and Co., Ltd. Nov. 23. 32733.

SOLID FORMALDEHYDE, production.—Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler. Nov. 23. (Germany, Nov. 29, '32.) 32756.

ORGANIC CONDENSATION PRDUCTS, manufacture.—E. I. Du Pont de Nemours and Co. Nov. 24. (United States, Nov. 25, '32.) 32911.

KETONES, manufacture.—E. I. Du Pont de Nemours and Co. Nov. 24. (United States, Nov. 25, '32.) 32912.

PROCESSES for reacting fatty acid and alkali.—J. T. Freestone and W. and F. Walker, Ltd. Nov. 23. 32683.

MONAZO DYESTUFFS insoluble in water, manufacture.—J. R. Geigy Akt.-Ges. Nov. 28. (Germany, Nov. 28, '32.) 33311.

REDUCTION OF TAR ACIDS in tar, etc., oils.—R. E. Goldsbrough. Nov. 29. 33397.

PREVENTION of corrosion of steel, etc.—J. Graham. Nov. 25. 32973.

RUST on cultivated plants, destroying.—W. W. Groves, and I. G. Farbenindustrie. Nov. 29. 33472.

NICKEL CARBONYL, manufacture.—C. F. R. Harrison and A. E. Wallis. Nov. 28. 33237, 33238.

NITROGENOUS CONDENSATION PRODUCTS, manufacture.—I. G. Farbenindustrie and J. Y. Johnson. Nov. 25. 33008.

ORGANIC SULPHUR COMPOUNDS, manufacture.—I. G. Farbenindustrie and J. Y. Johnson. Nov. 25. 33009.

SUBSTITUTION PRODUCTS of anthrones, manufacture.—I. G. Farbenindustrie and J. Y. Johnson. Nov. 25. 33010.

APPARATUS for measuring refrigerating capacity.—I. G. Farbenindustrie and J. Y. Johnson. Nov. 29. 33461.

LIQUID medicinal, disinfecting and cosmetic preparations, manufacture.—I. G. Farbenindustrie. Nov. 23. (Germany, Nov. 24, '32.) 32773.

LIQUID medicinal, disinfecting and cosmetic preparations.—I. G. Farbenindustrie. Nov. 23. (Germany, Nov. 26, '32.) 32774.

SULPHUR DYESTUFFS, manufacture.—I. G. Farbenindustrie. Nov. 27. (Germany, Dec. 24, '32.) 33176.

2-NITRODIPHENYL, manufacture.—I. G. Farbenindustrie. Nov. 29. (Germany, Dec. 24, '32.) 33466.

DRYING OILS.—Imperial Chemical Industries, Ltd. Nov. 24. 32913.

ARYLAMIDES, manufacture.—Imperial Chemical Industries, Ltd. W. A. Sexton, J. K. Thomson and F. J. Wilson. Nov. 27. 33125.

CELLULOSE ESTERS, manufacture.—Imperial Chemical Industries, Ltd. Nov. 28. 33297.

ANTHRAQUINONE DERIVATIVES, manufacture.—Imperial Chemical Industries, Ltd., and F. Lodge. Nov. 28. 33298.

CONDENSATION PRODUCTS from urea, etc.—W. Kraus. Nov. 25. (Germany, Nov. 25, '32.) 33028.

CONDENSATION PRODUCTS from urea, etc., manufacture.—W. Kraus. Nov. 25. (Germany, Jan. 4.) 33029.

CONDENSATION PRODUCTS from urea, etc., manufacture.—W. Kraus. Nov. 25. (Germany, Jan. 12.) 33030.

CONDENSATION PRODUCTS from urea, etc., manufacture.—W. Kraus. Nov. (Germany, July 31.) 33031.

RUBBER LATEX, treatment.—Naugatuck Chemical Co. Nov. 24. (United States, Feb. 23.) 32953.

LATEX, creaming.—Naugatuck Chemical Co. Nov. 24. (United States, June 24.) 32954.

HIGHLY PLASTIC colloidal tungsten compounds.—A. Pacz. Nov. 23. (Germany, Nov. 24, '32.) 32768.

CONDENSATION PRODUCTS of diisobutylene and polyhydric phenols.—Resinous Products and Chemical Co., and W. W. Triggs. Nov. 24. 32929.

DIANE, process of making.—Resinous Products and Chemical Co., and W. W. Triggs. Nov. 24. 32930.

WATER-SOLUBLE DERIVATIVE of 8-hydroxy-quinoline.—J. D. Riedel-E. de Haën Akt.-Ges. Nov. 24. (Germany, Dec. 9, '32.) 32886.

ARGILLACEOUS MATERIAL, treatment.—Allied Process Corporation. Dec. 5. (United States, Jan. 3.) 34097.

RUSTLESS IRON and steel alloys.—Alloy Research Corporation. Nov. 30. (United States, Dec. 3, '32.) 33594.

RUBBER COMPOSITIONS, manufacture.—Anode Rubber Co., Ltd. Dec. 2. (Aug. 13, '32.) 33908.

POWDERED INSECTICIDES, manufacture.—J. van Baak. Dec. 6. (Holland, Dec. 7, '32.) 34327.

CELLULOSE ACETATE coluble in acetone, production.—E. Berl and A. H. Stevens. Dec. 5. 34165.

BINDING of oils, fats, etc., with water.—O. Bratke. Dec. 6. 34335.

TIN FROM ORES, etc., extraction.—British American Mines, Ltd., and L. A. Wood. Dec. 4. (Dec. 24, '32.) 34084.

GASES, purification.—British Oxygen Co., Ltd. Dec. 6. 34340.

EMULSIONS for treatment of road surfaces, etc.—Burt, Boulton and Haywood, Ltd., and F. J. E. China. Nov. 30. 33642.

DENTURES, and compositions therefor.—Carbide and Carbon Chemicals Corporation. Dec. 5. (United States, Dec. 27, '32.) 34166.

VIOLET SULPHUR DYESTUFFS, manufacture.—A. Carpmael and I. G. Farbenindustrie. Dec. 4. 34036.

ADHESIVES.—Dunlop Rubber Co., Ltd., F. A. Jones and D. F. Twiss. Dec. 5. 34133.

DIAZOIMINO COMPOUNDS, etc.—E. I. Du Pont de Nemours and Co. Dec. 4. (United States, Dec. 3, '32.) 34090, 34091.

FUEL OIL.—E. I. Du Pont de Nemours and Co. Dec. 6. (United States, Dec. 6, '32.) 34294.

WETTING-OUT AGENTS.—M. Fitzgibbon and Lunevale Products, Ltd. Dec. 4. 34056.

GLASS permeable to ultra violet light, etc., manufacture.—I. G. Farbenindustrie and J. Y. Johnson. Dec. 2. 33910.

VOLATILE ACIDS or bases from liquids, recovery.—I. G. Farbenindustrie and J. Y. Johnson. Dec. 2. 33911.

SEPARATION of ammonia and hydrogen sulphide from gases.—I. G. Farbenindustrie and J. Y. Johnson. Dec. 4. 34040.

OILS from hydrocarbon mixtures, manufacture.—I. G. Farbenindustrie and J. Y. Johnson. Dec. 6. 34338.

QUINOLINES, manufacture.—I. G. Farbenindustrie and J. Y. Johnson. Dec. 6. 34339.

EMBEDDING MASS for dental purposes. I. G. Farbenindustrie. Nov. 30. (Germany, Dec. 1, '32.) 33685.

PRODUCTS of polymerisation, manufacture.—I. G. Farbenindustrie. Dec. 1. (Germany, Dec. 10, '32.) 33802.

ARTIFICIAL COMPOSITIONS, manufacture.—I. G. Farbenindustrie. Dec. 2. (Germany, Dec. 10, '32.) 33909.

DYEING CELLULOSE ESTERS or others.—I. G. Farbenindustrie. Dec. 4. (Germany, Dec. 3, '32). 34024.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Finland.—A firm in Helsingfors is desirous of representing United Kingdom exporters of heavy and industrial chemicals. (Ref. No. 673.)

Italy.—An agent established at Milan wishes to obtain the representation of United Kingdom manufacturers of oils and fats for soap, paper, textile and leather trades; colours, resin and raw materials used in the manufacture of paints and varnishes. (Ref. No. 677.)

New Zealand.—A Wellington firm of agents desires to represent United Kingdom manufacturers of paints, enamels, lacquers, varnishes, etc., on a basis to be arranged, for the whole of New Zealand. (Ref. No. 667.)

Forthcoming Events

Dec. 16.—North of England Institute of Mining and Mechanical Engineers. General meeting. 2.30 p.m. Newcastle-on-Tyne.

Dec. 19.—Institution of the Rubber Industry. (Scottish Section). "Tubing Machines and Extrusion Problems." H. Willshaw. 25 Charlotts Square, Edinburgh.

Dec. 19.—Institute of Fuel (North-Western Section). "Oil for Central Heating and Other Purposes." Dr. A. E. Dunstan. 7 p.m. Engineers' Club, Manchester.

Dec. 19.—The Paint Club. Ladies' Night. 7 p.m. The Trocadero Restaurant, London.

Dec. 20.—Institute of Chemistry (Aberdeen and North of Scotland Section). "Food Fakes and Food Laws." Andrew Dargie. 5.15 p.m. Chemistry Department, Marischal College, Aberdeen.

Dec. 21.—The Chemical Society. Ordinary Scientific Meeting. 8 p.m. Burlington House, London.

Dec. 21.—Society of Chemical Industry (South Wales Section). "Christmas Trees and Others." E. A. Rudge. 7 p.m. Technical College, Cardiff.

Dec. 22.—Society of Dyers and Colourists (Scottish Section). "Lake Colours and Pigments." A. H. Whitaker. 7.15 p.m. George Hotel, Buchanan Street, Glasgow.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

PRICES of chemical products remain practically unchanged, and a slight improvement in overseas trade is reported, with an increase in forward business. The home demand has been on a satisfactory scale. Among industrial chemicals there has been a better inquiry for acetic acid, lithopone and sodium sulphide. Other products in good demand are acetone, formic acid, ammonium chloride, formaldehyde, hydrochloric and oxalic acids. Potassium compounds are somewhat dull. Considerable activity has been experienced in the coal tar products market, the one exception being pitch. Increased prices have been announced for certain grades of cresylic acid. Fluctuations in exchange rates have produced unsettled conditions in the pharmaceutical chemical market, and there has been only a limited demand for essential oils.

LONDON.—There is nothing fresh to report on the London coal tar market. Prices remain fairly firm, and the majority are unchanged since last week.

MANCHESTER.—Conditions on the Manchester chemical market during the past week have continued to be fairly active, and sellers again report a fair amount of interest in forward commitments, a number of decent sized contracts for delivery over next year having been placed. Deliveries into consumption have also been about maintained at their recent improved level, though there is a general disposition to look for a tapering off in this respect after the end of this week, with seasonally quiet conditions prevailing until early in the New Year. From the point of view of prices, there is little of which to complain. There are occasional weak spots, but the majority of products are quite steady. Some degree of reaction has occurred during the past week in respect of certain of the by-products but, on the whole, business has been on a moderate scale, with pitch attracting a little more attention, perhaps, whilst most of the light materials, the toluols and xylols and solvent naphtha, in particular, have been extremely firm.

SCOTLAND.—Business has been rather quiet during the last week in the Scottish heavy chemical market, although many inquiries are being received purely for prices for contracts over 1934.

General Chemicals

The following changes in the prices of general chemicals are reported; for all other general chemicals the prices remain as given in THE CHEMICAL AGE last week (pp. 538-539).

ACID, OXALIC.—LONDON: £47 17s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £49 to £52 ex store. MANCHESTER: £48 to £54 ex store.

ARSENIC.—LONDON: £16 10s. c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered, £23 ex wharf. MANCHESTER: White powdered Cornish, £21 at mines.

FORMALDEHYDE.—LONDON: £27 per ton. SCOTLAND: 40%, £28 ex store.

POTASH, CAUSTIC.—LONDON: £42. MANCHESTER: £40 to £41.

SODIUM NITRITE.—LONDON: £17 10s. to £19 10s. per ton d/d station in drums.

Coal Tar Products

ACID, CARBOLIC.—Crystals, 9d. to 10d. per lb.; crude, 60's, 2s. 5d. to 2s. 6d. per gal. MANCHESTER: Crystals, 8¾d. per lb.; crude, 2s. 5d. to 2s. 6d. per gal. SCOTLAND: 60's, 2s. 6d. to 2s. 7d.

ACID, CRESYLIC.—90/100%, 1s. 8d. to 2s. 3d. par gal.; pale, 98%, 1s. 6d. to 1s. 7d.; according to specification; refined, 1s. 9d. to 1s. 10d. LONDON: 98/100%, 1s. 3d.; dark, 95/97%, 11d. SCOTLAND: Pale, 99/100%, 1s. 3d. to 1s. 4d.; 97/99%, 1s. to 1s. 1d.; dark, 97/99%, 11d. to 1s.; high boiling acid, 2s. 6d. to 3s.

BENZOL.—At works, crude, 10d. to 10½d. per gal.; standard motor 1s. 5d. to 1s. 5½d.; 90%, 1s. 6d. to 1s. 7d.; pure, 1s. 8½d. to 1s. 9d. LONDON: Motor, 1s. 6½d. SCOTLAND: Motor, 1s. 6½d. to 1s. 7½d.; 90%, 2s. 0½d. to 2s. 1½d.

CREOSOTE.—B.S.I. Specification standard, 3½d. to 3¾d. per gal. f.o.r. Home, 3¾d. d/d. LONDON: 3d. to 3¼d. f.o.r. North; 4d. to 4½d. London. MANCHESTER: 3d. to 4¼d. SCOTLAND: Specification oils, 3¼d. to 4d.; washed oil, 3¼d. to 4d.; light, 3½d.; heavy, 4½d. to 5d.

NAPHTHA.—Solvent, 90/160%, 1s. 4d. to 1s. 5d. per gal.; 95/160%, 1s. 8d. to 1s. 9d.; 99/190%, 11d. to 1s. 1d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3½d.; 90/190%, 11d. to 1s. 2d.

NAPHTHALENE.—Crude, Hot-Pressed, £6 1s. 3d. per ton. Flaked £10 per ton. Purified crystals, £9 15s. per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 70s. to 75s.

PITCH.—Medium soft, £3 10s. to £3 12s. per ton. SCOTLAND: £3 15s. to £4 f.o.b. Glasgow. MANCHESTER: £3 5s. to £3 7s. 6d. f.o.b. LONDON: £3 7s. 6d. to £3 10s. f.o.b. East Coast port for next season's shipment.

PYRIDINE.—90/140, 5s. to 5s. 6d. per gal.; 90/180, 2s. to 2s. 6d. SCOTLAND: 90/160%, 4s. to 5s.; 90/220%, 1s. 9d. to 2s. naked.

REFINED COAL TAR.—SCOTLAND: 4d. per gal.

TOLUOL.—90%, 2s. 9d. to 2s. 10d. per gal.; pure, 3s. 3d.

XYLOL.—Commercial, 2s. 9d. to 2s. 10d. per gal.; pure, 3s.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—Home, £7 per ton; export, nominal, £6 11s. 3d. f.o.b. U.K. ports in single bags.

CYANAMIDE.—£7 2s. per ton, carriage paid to railway station.

NITRATE OF SODA.—£7 13s. 6d. per ton nearest station.

NITRO-CHALK.—£7 5s. per ton nearest station.

CONCENTRATED COMPLETE FERTILISERS.—£10 15s. to £11 6s. per ton according to percentage of constituents.

NITROGEN PHOSPHATE FERTILISERS.—£10 5s. to £13 15s. per ton according to percentage of constituents.

New Chemical Trade Marks

Compiled from official sources by Gee and Co., Patent and Trade Mark Agents, 51-52 Chancery Lane, London, W.C.2.

Opposition to the registration of the following trade marks can be lodged up to December 22, 1933.

Sturncote. 545,286. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Alex. Cameron and Sons, Ltd., Camrex House, Hudson Road, Sunderland. October 12, 1933.

Aganox. 542,836. Class 1. Fluid preparations for the prevention or removal of scale and rust in boilers. G. W. Humphries, Sociedad en Comandita Por Acciones, trading also as The Mexican Fibre Co., Edificio Las Novedades, Avenue Capitan Emilio Carranza, No. 48, Oriente, Tampico, Mexico. July 6, 1933.

Velvasal. 545,709. Class 1. Salt for use in manufactures. Palmer, Mann & Co., Ltd., 9-10 Pancras Lane, London, E.C.4. October 27, 1933.

Opposition to the registration of the following trade marks can be lodged up to December 29, 1933.

Gem. 545,157. Class 1. Caustic soda. The Cudahy Packing Co. (a Corporation organised under the laws of the State of Maine), 221 North La Salle Street, Chicago, Illinois, and 33rd and Q Streets, South Omaha, Nebraska, United States of America. October 9, 1933.

Imatrex. 545,249. Class 1. Chemical substances used in the manufacture of explosives. Finska Elektrokemiska Aktiebolaget, Glogatan 3, Helsingfors, Finland. October 11, 1933.

Opposition to the registration of the following trade marks can be lodged up to January 6, 1934.

Keragel. 542,669. Class 1. Paints, varnishes, lacquers and anti-corrosives. H. Windsor and Co., Ltd., 748 Fulham Road, Fulham, London, S.W.6. June 29, 1933.

Rensec. 545,099. Class 1. Liquid preparations (in the nature of paint) for waterproofing wood, stone and the like surfaces. The firm trading as Dryco, 3 Church Walk, London, W.8. October 6, 1933.

"Fearnought." 545,836. Class 1. Glue, gelatine for use in manufacture, and size. William Lovering Verral, 49d St. Paul's Street, Leeds, 1; Yorkshire. November 2, 1933.

Books Received

The Institution of Gas Engineers. Transactions 1928-29 Vol. 78. 1929-30. Vol. 79. London: Institution of Gas Engineers. Pp. 490 and 914.

The Mineral Industry of the British Empire and Foreign Countries. Statistical Summary 1930-32. Imperial Institute. London: H.M. Stationery Office. Pp. 430. 6s. 6d.

On a New Chemical Theory and Researches on Salicylic Acid. Papers by Archibald Scott Couper. Alembic Club Reprints No. 21. London: Gurney and Jackson. Pp. 45. 2s. 6d.

From Week to Week

MR. WM. GRINDLAY, chemist at the Dillichip Works, Bonhill, of the United Turkey Red Co., Ltd., was found dead in the works laboratory on December 11.

MR. FREDERICK WILLIAM FLETCHER, late governing director of Fletcher, Fletcher and Co., Ltd., manufacturing chemists, Vibrona Laboratories, Holloway, N., left estate of the gross value of £274,337 (net personalty £270,878).

MR. S. G. CRIMES, of 150 Southampton Row, W.C.1, was appointed receiver and manager of the Chromium and Nickel Plating Co., Ltd., on September 16, 1933, under powers contained in debentures dated October 19, 1932.

AN INQUEST WAS HELD AT BARNSLEY on December 11 on Mr. Mr. Hubert Dawson (61), Moorland Court, Barnsley, a director and secretary of British Barytes, Ltd., Silkstone, who was knocked down and killed by a passenger train on the L.N.E.R. near Silkstone station on Friday night.

AN EXHIBITION illustrating the method employed by the Anglo-American Oil Co., Ltd., in producing Essolube motor oil by the hydrogenation process, was opened last month at the Central Station, Glasgow. In a previous reference to the exhibition the name of the product was inadvertently misspelt.

SIR GILBERT VYLE, managing director of W. and T. Avery, Ltd., of Birmingham, and a member of the Overseas Trade Development Council, who died at his residence at Moseley, Birmingham, on September 7 last, at the age of 63, left £23,112. Sir Gilbert was chairman of the British Preparatory Committee to the Imperial Conference at Ottawa.

THE IMPORT DUTIES ADVISORY COMMITTEE has received an application for an increase in the import duty on lead acetate and superphosphate. Representations should be addressed in writing to the Secretary, Import Duties Advisory Committee, Caxton House (West Block), Tothill Street, Westminster, London, S.W.1, not later than January 8, 1934.

THE DUKE OF YORK opened a new £125,000 carbonising plant at the Tottenham and District Gas Co.'s works on December 12. He inaugurated the new intermittent vertical retort plant by first tipping a truck of coal to charge one of the new retorts. He then discharged one of the ovens, which released a shower of red hot coke.

THE POISONS BOARD established by Section 16 of the Pharmacy and Poisons Act, 1933, held its inaugural meeting at the Home Office on December 7, when it was welcomed by the Home Secretary. The Board appointed Mr. M. D. Perrins, of the Home Office, as secretary, to whom any communications to the Board should be addressed. Mr. K. B. Paice was appointed assistant secretary.

NEW WORKS HAVE BEEN OPENED at Brentford for the production of Brittol, the motor fuel energiser, which is a highly concentrated liquid containing ether, ammonia and other substances. It is claimed that this energiser imparts to all motor fuels an energy giving approximately 15 per cent. greater mileage in addition to easier starting from cold and improved acceleration, without causing injury to motor engines.

AN INTERNATIONAL COMPETITION concerning new uses for bone glue is announced in our advertisement columns this week. There is a minimum prize fund of 20,000 Swiss francs (about £1,200). Copies of the rules and full information may be obtained from British Glues and Chemicals, Ltd. (Dept. I/S), Imperial House, Kingsway, W.C.2. Early application is advisable as all memoranda must be received by February 28, 1934.

PROFESSOR JOHN JOLY, professor of geology and mineralogy in the University of Dublin since 1897, died in Dublin on December 9. Dr. Joly was a son of the late Rev. J. P. Joly, of Holywood, King's County, and Mrs. Joly, a daughter of Frederick, Count de Lusi. He was president of the Royal Dublin Society, a fellow of the Royal Society of London and received a Royal medal of the Society in 1910.

AN INCREASE IN THE ADULTERATION of food is shown in a Ministry of Health Blue Book published this week. Nearly 138,000 samples of food and drugs were analysed by public analysts in 1932, a considerable increase over the largest number previously recorded. The number of samples reported as adulterated or not up to standard was 7,019, or 5.1 per cent. of the number analysed. This is a slight increase as compared with the two previous years in which the percentages of adulteration were 4.6 and 4.8 per cent. respectively. In two hundred instances preservative prohibited by the regulations was contained in the food, and 131 samples contained preservative in excess of the amount permitted. Of 72,940 milk samples, 5,307 or 7.3 per cent. were reported as adulterated or not up to standard, a considerable increase on 1930 and 1931 when the corresponding percentages were 6.6 and 6.4. These numbers do not include samples which are tested informally by officers of local authorities.

THE LIBRARY of the Chemical Society will be closed for the Christmas holiday from 1 p.m. on Friday, December 22, until 10 a.m., on Thursday, December 28.

THE UNILEVER CO. has established an East Indian subsidiary company with a capital of 2,000,000 florins, of which 1,500,000 florins is paid up. It is intended to manufacture soap, and, possibly at a later date, margarine.

THE WORKS, WAREHOUSES AND OFFICES of Howards and Sons, Ltd., Ilford, will be closed for the Christmas holidays on December 25 and 26, and the warehouses will also be closed on December 29 and 30 for stocktaking.

MR. R. FORTH, head of the Supplies Department of the Scottish Dyes, Ltd., has been promoted to the Huddersfield factory. He came to Grangemouth in 1930 from Winnington. In succession to Mr. Forth, Mr. T. F. Calverley has been transferred from Hexagon House, Manchester.

MR. E. THORNTON, M.Sc., A.I.C., technical superintendent of the National Oil Refinery works at Skewen, Glam., recently addressed a joint meeting of the West Wales branches of the Society of Chemical Industry and the Institute of Chemistry at Swansea, on "The Extraction and Refining of Paraffin Wax."

DR. GEORGE TATE, F.I.C., F.C.S., whose retirement from the Holt Technical School, Birkenhead, after thirty years' service was recently announced in these columns, died last month. Until a week prior to his death, Dr. Tate practised as an analytical chemist in Liverpool. He was a member of the Institute of Chemistry for forty-five years, and served on the council of the Institute from 1921-25.

AN OUTBREAK OF FIRE, involving damage which may amount to £1,000, occurred at the Bromborough Dock premises of Lever Bros., Ltd., Port Sunlight, on December 12. The outbreak was discovered shortly after ten o'clock in the morning in one of the sheds used for storing copra, which was piled up to the roof ready for despatch to the Port Sunlight mills.

SOAPOILS, LTD., at an extraordinary general meeting on December 4, resolved that the company be wound up voluntarily. Mr. R. C. Fletcher was nominated liquidator. At a subsequent meeting of creditors, however, the appointment of Mr. Fletcher was not confirmed, and Mr. G. F. R. Baguley, of 4b Frederick's Place, Old Jewry, London, E.C.2, was nominated and appointed liquidator.

NOTICE WAS GIVEN in the "London Gazette" of December 8 that an Order of the Manchester Chancery Court, confirming the reduction of the capital of the Waterdale Dyeing and Finishing Co., Ltd., from £70,000 to £56,000, and the minute approved by the court showing with respect to the share capital of the company, as altered, the several particulars required by law, were registered by the Registrar of Companies on December 1.

MR. ELLIOTT CUMBERLAND, of Coombe Hill Golf Club, Malden, Surrey, whose name will be remembered for his discovery of the electrolytic system of corrosion prevention, which has saved shipowners huge sums of money, has died at the age of 61, following a long illness. His system was adopted by the British Navy, France, United States, Italy, and the Argentine. Before the discovery of Mr. Cumberland's electrolytic boiler and condenser, corrosion had been a constant source of trouble to shipowners.

MR. EDWARD ARTHUR BROOK, works chemist, John W. Leitch and Co., Ltd., Milnsbridge Chemical Works, Huddersfield, has been presented with a barometer mounted on an oak panel, in recognition of 30 years' faithful service. Mr. Donald J. Leitch, governing director of the company, mentioned that Mr. Brook commenced as a laboratory boy in 1903, under the late Mr. John W. Leitch, founder of the firm, and during his long period of service had had charge, at one time or another, of almost every department in the works.

THE BOARD OF TRADE has given notice in the "London Gazette" that under the provisions of the Import Duties Act, 1932, and the Safeguarding of Industries Act returns for 1934 will be required as to the condition and progress of trades and industries engaged in manufacturing goods which, if they were imported, would be chargeable with Customs or Safeguarding duties. The list of trades and industries from which returns are required includes: Coke and by-products; cement; building materials and abrasive trades; brick and fireclay; china and earthenware; glass; chemical and allied trades; fertiliser, disinfectant, glue, and allied trades; explosives and fireworks; paint, colour and varnish; seed crushing; oil and tallow; soap and candle; starch, blue, polishes, ink and kindred trades; iron and steel non-ferrous metals (smelting, rolling and casting); artificial silk; engine and boiler packing and asbestos; roofing and flax felts; butter, cheese, condensed milk and margarine; paper; wallpaper; rubber; linoleum and oil cloth; incandescent mantles; and scientific instruments, apparatus and appliances.

Company News

W. and T. Avery, Ltd.—A dividend of 5 per cent., less tax at 4s. 10½d. is announced on the ordinary shares, payable on January 1.

Bradford Dyers' Association.—It is reported that the directors have decided to postpone the preference payment due on January 1.

Cape Asbestos Co.—The dividend on the 5 per cent. cumulative participating preference shares has been declared payable on January 1.

International Nickel of Canada.—A quarterly dividend at the rate of 7 per cent. per annum on the preference stock, is payable on February 1.

United Indigo and Chemical Co.—A dividend is announced of the 5 per cent. preference shares for the six months ending December 31, 1933.

Boots Pure Drug Co., Ltd.—The usual quarterly interim dividend of 6 per cent., less tax, will be paid on December 31 to ordinary shareholders.

Zinc Manufacturing Co.—For the year to June 30, 1933, a gross profit of £2,628 is shown, which compares with a loss of £11,726 in the previous year. After depreciation, a loss of £31,038 compares with one of £47,629 in 1931-32.

British Silk Dyeing Co.—The accounts to September 30 last show a net loss of £30,873, including £12,435 by depreciation. The development account stands at £63,437, and the preliminary expenses £18,829.

Joseph Nathan & Co.—The accounts for the year ended September 30, 1933, are expected to show a net profit of £39,437, compared with £21,825 last year. The report will be issued in March, when the annual meeting will be held. No ordinary dividend has been paid since 1929-30, when 10 per cent. was distributed.

Babcock & Wilcox Dampfkesselwerke A.G.—This German subsidiary of Babcock and Wilcox, Ltd., proposes a dividend of 4 per cent. for 1932-33 on its share capital of Rm.8,000,000. This is at the same rate as for the preceding year.

Broken Hill South.—For the year to June 30 last the balance sheet shows supplies and stores £14,594, against £42,309 in the previous year; metals unrealised £462,875 (£277,932); debtors £12,241 (£12,719); deposits £220,450 (£350,100); cash £33,471 (£14,915); and creditors, £52,193 (£45,107).

Low Temperature Carbonisation, Ltd.—The report for the year to October 31, 1933, shows a credit balance on trading account of £48,280, compared with £39,079 in the previous year. Income from Doncaster Coalite is £12,131, against £9,167, and after fees, expenses, etc., a balance of £39,302 compares with £33,038. After debenture charges and depreciation, the balance of £13,456 eliminates the debit on profit and loss, leaving a credit balance of £7,458.

Splintex Safety Glass Co.—A loss is reported for the year to June 30, of £24,974, increasing the debit to be carried forward to £47,553. No preference dividend has been paid for two years.

Ilford, Ltd.—A trading profit, including dividends received, but after depreciation, of £97,963 is shown for the year to October 31, 1933, which compares with £108,041 in 1931-32. After payment of directors' fees, the net balance is £94,611, against £104,682. Reserve again receives £20,000 from profits, while the ordinary dividend is repeated at 6 per cent., less tax. The amount carried forward is £22,147, against £25,888 brought in.

Taylors (Cash Chemists), London.—In their report for the year to September 30, 1933, the directors state that with the dividend on the £750,000 7½ per cent. cumulative preferred ordinary £1 shares nearly two years in arrear, they propose to convene meetings early next month to consider a scheme for capital rearrangement. The accounts show that net trading profit, dividends receivable, etc., has risen from £10,272 to £17,241, amortisation and depreciation takes £10,119, against £6,306, but tax provision requires approximately £1,000 less at £9,014, while last year £6,527 was charged against revenue, as expenditure in connection with branches closed down £18,578 to £28,193. After the payments announced in March and September on account of dividend arrears, the directors recommend an initial transfer of £10,000 to a reserve fund, leaving a carry-forward of £5,833 against £4,515 brought in.

New Companies Registered

"Campston" Patents Co., Ltd. Registered December 6. Nominal capital £100. Founders, smiths, machinists, analytical chemists, manufacturers of metals and alloys of all kinds, etc. Directors: Owen Sutton, 1 Glendale Avenue, Monkseaton, Heather W. Sutton, Wm. J. Campbell.

"Steelite" Foundry Co., Ltd. Registered December 6. Nominal capital £8,000. Founders, smiths, machinists, analytical chemists, manufacturers of metals and alloys of all kinds, etc. Directors: Owen Sutton, 1 Glendale Avenue, Monkseaton, Heather W. Sutton, Wm. J. Campbell, Mount Pleasant, Lyndhurst Grove, Low Fell, Gateshead.

The Millwall Syndicate, Ltd., 8 Princess Street, London, E.C.2. Registered as a private company on December 5. Nominal capital £1,000. Distillers, extractors, producers, manufacturers and suppliers of solid, liquid and gaseous substances or matter derived from coal or from the derivatives or residuals thereof, manufacturers of and dealers in fuels, tar, sulphate and other forms of ammonia, oils, chemicals, etc.

Universal Adhesives, Ltd., 45 Hope Street, Glasgow, C.2. Registered in Edinburgh on December 5. Nominal capital £1,000 in £1 shares. Chemical manufacturers and manufacturers of all kinds of adhesives, etc. Directors: James Shields, Dr. Daniel Robertson.